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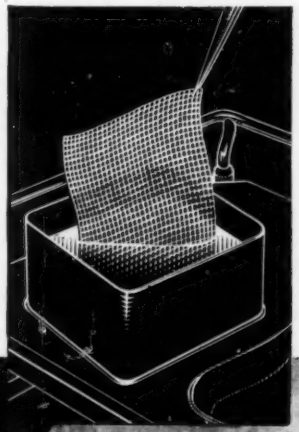

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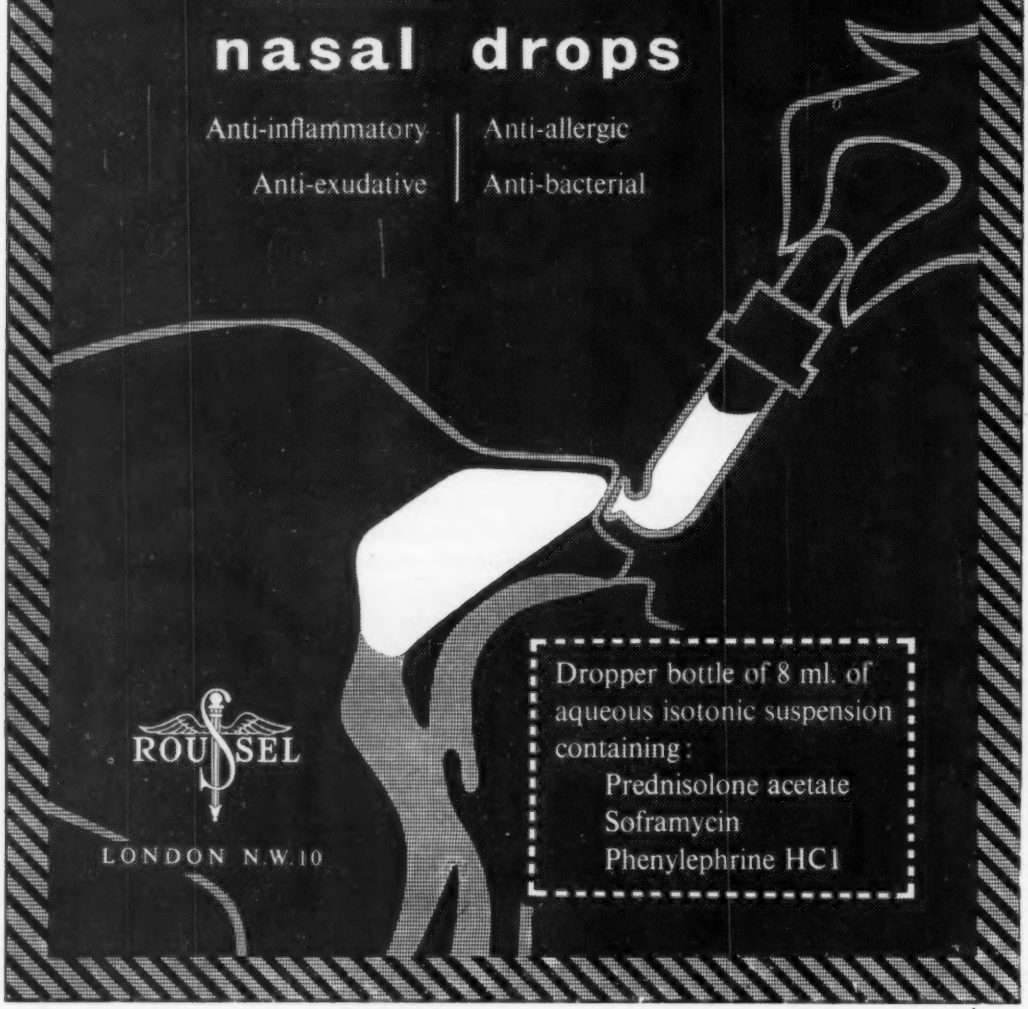

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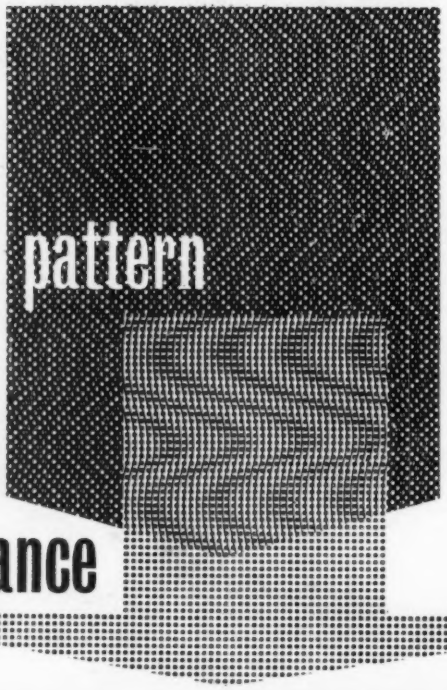

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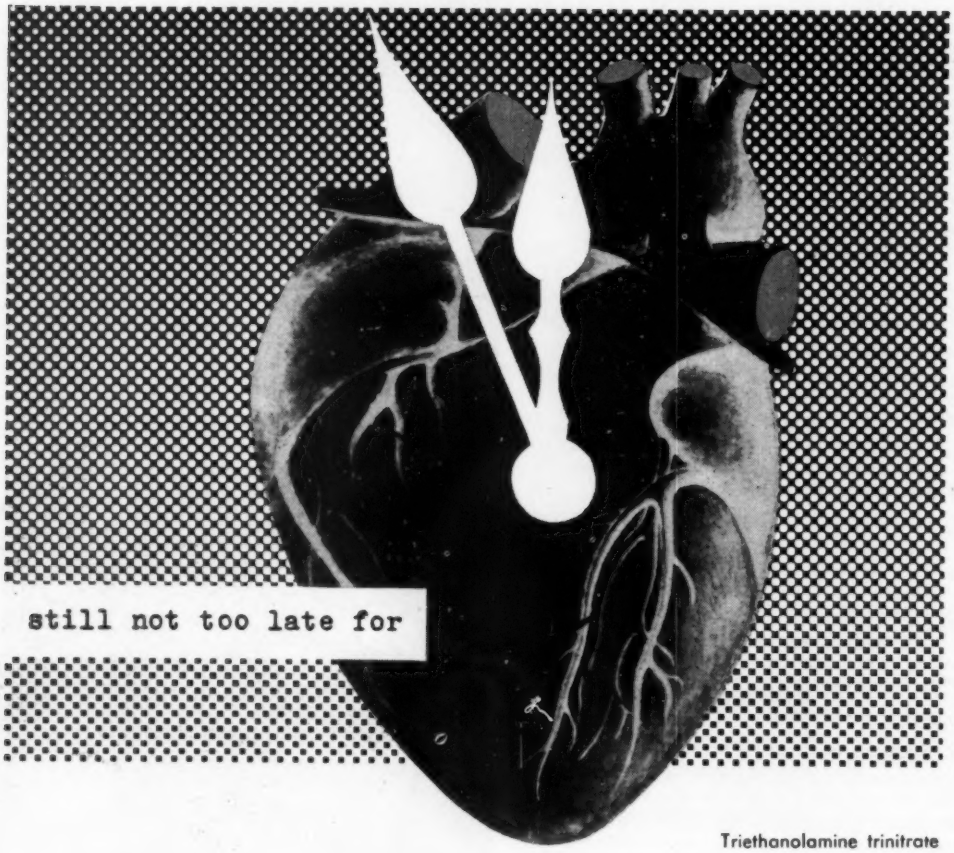

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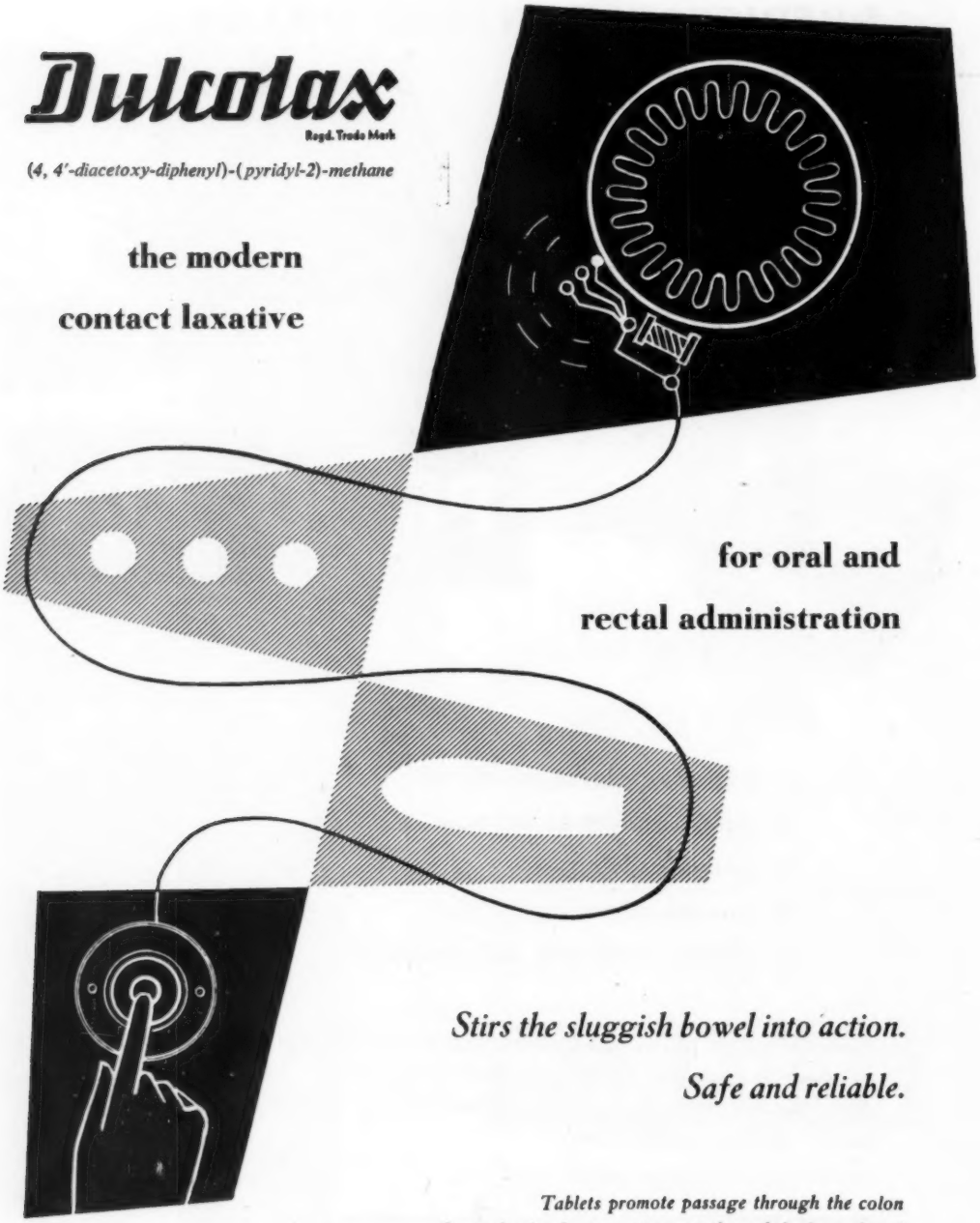

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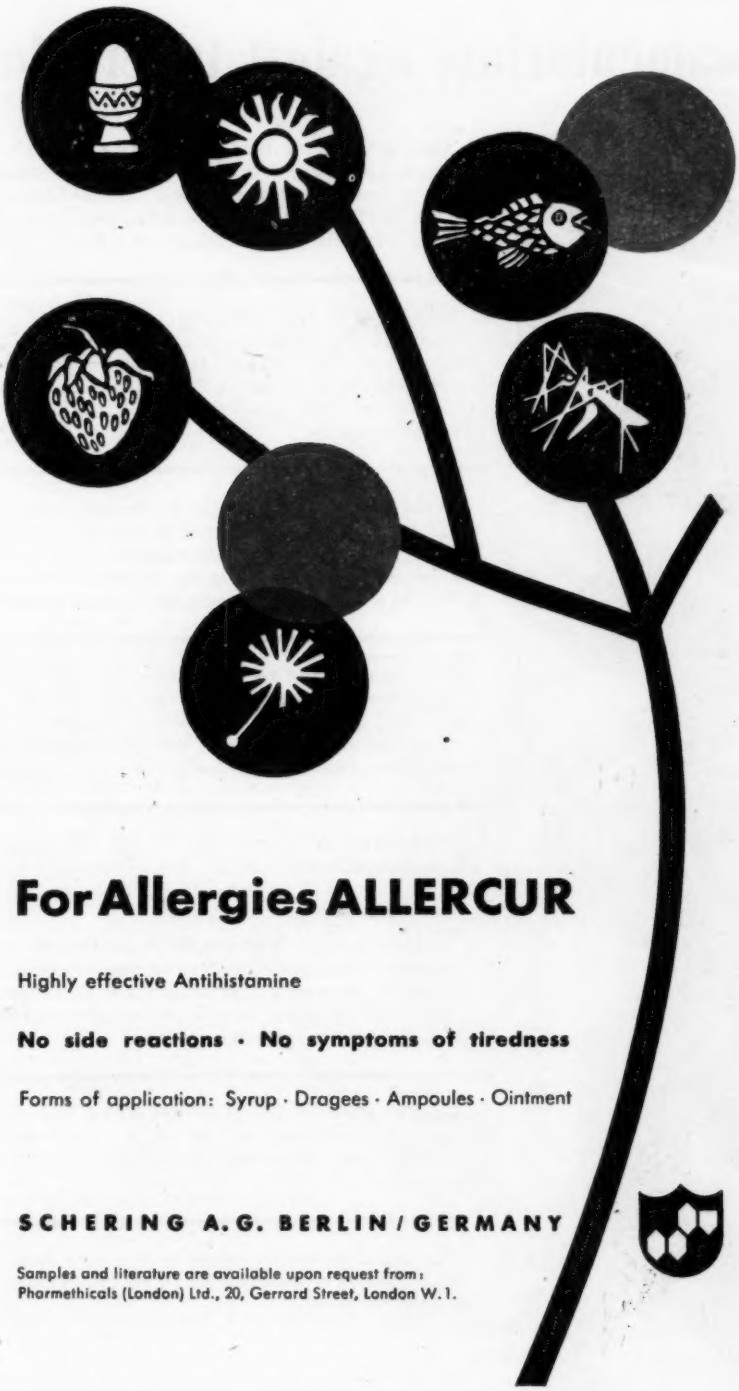

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Vertigo, it has been claimed†, is primarily due to a disturbance of those organs of the body that are responsible for body balance. When the posture of the head is changed, the gelatinous substance in the semi-circular canals begins to flow. This flow initiates neural impulses which are transmitted to the vestibular nuclei. From this point impulses are sent to different parts of the body to cause the symptom complex of vertigo.

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The site of Dramamine's action is probably in the labyrinthine structure.

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† " Dizziness " : Vertigo and Syncope, G.P. *8*:35 (Nov.) 1953.

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The high tetracycline levels attained with ACHROMYCIN V are noticeable even within the first hour or two after administration.

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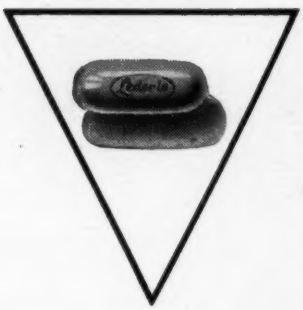

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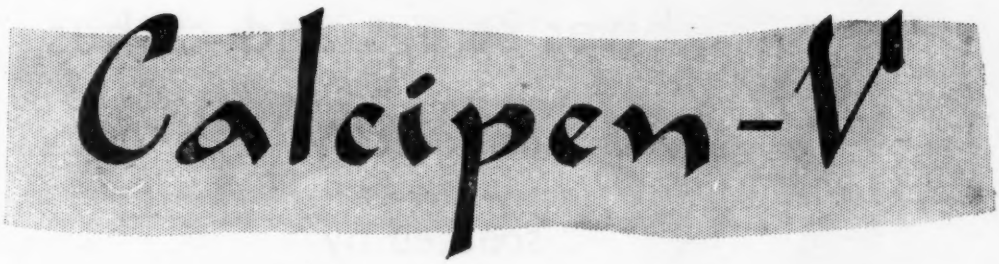

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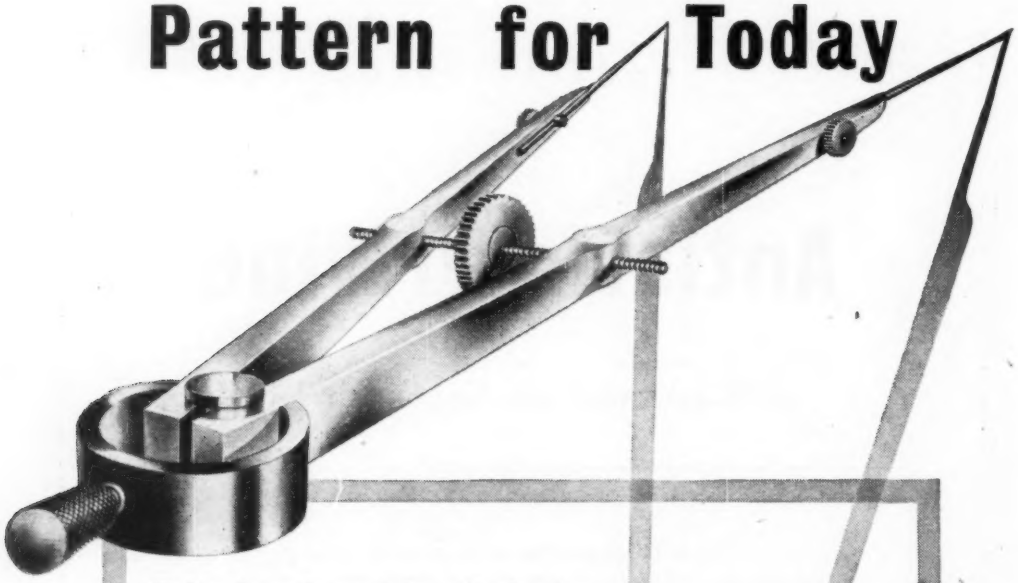

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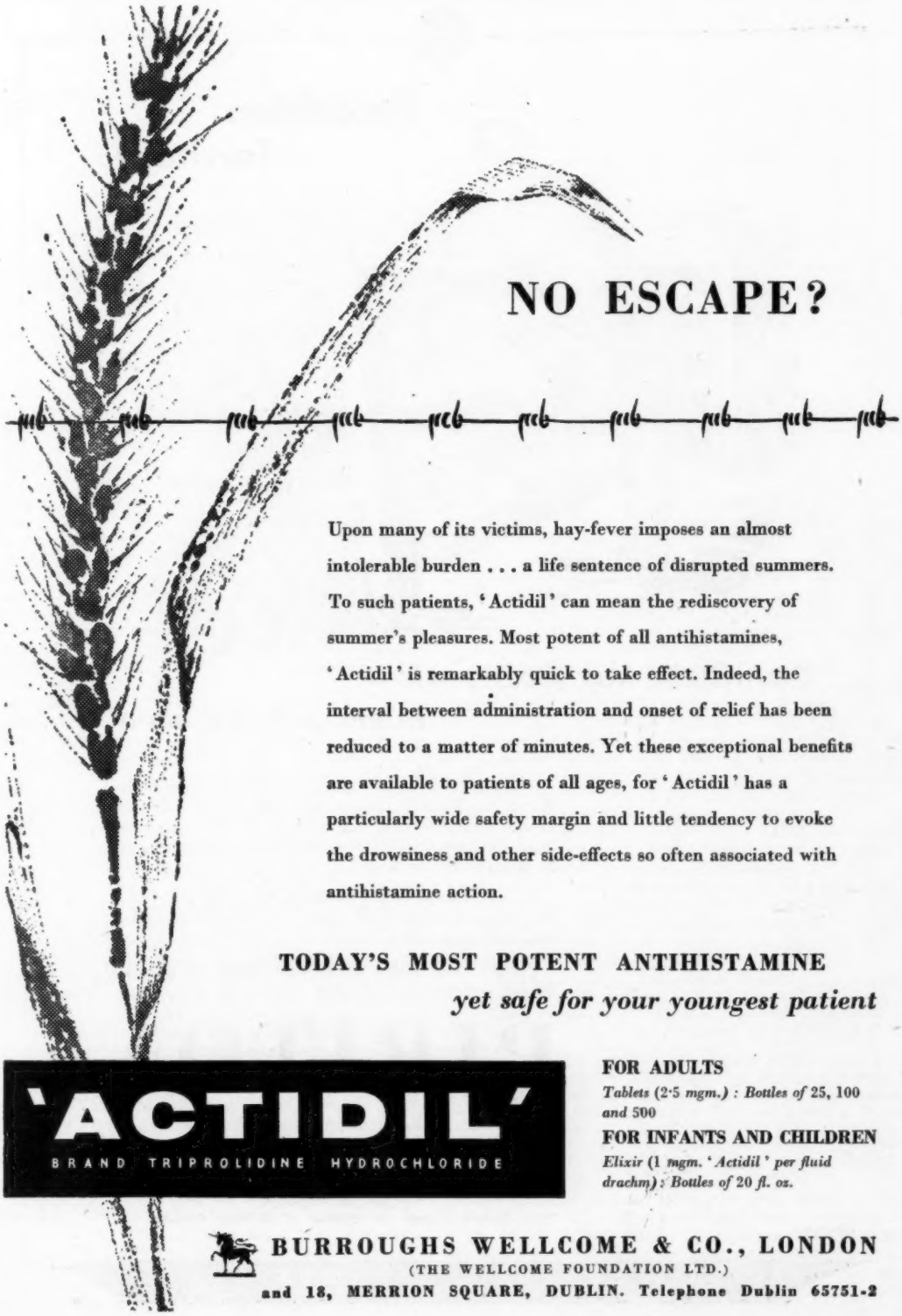

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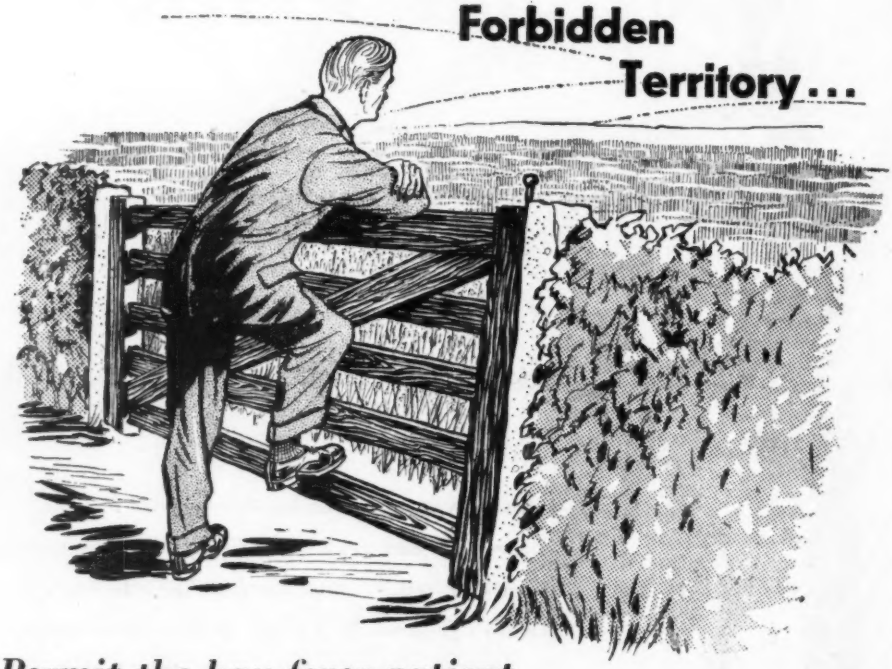

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Piriton, an improved antihistamine, is unexcelled in the degree and speed of relief that it affords and its freedom from side-effects.

Piriton is available in a wide range of practical dosage forms to suit all ages.

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(Chlorpheniramine maleate)

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ATRIAL SEPTAL DEFECT AND ITS SURGICAL TREATMENT

D. EVAN BEDFORD
M.D. Lond., F.R.C.P.
PHYSICIAN, DEPARTMENT OF CARDIOLOGY

T. HOLMES SELLORS
D.M., M.Ch. Oxfd, F.R.C.S.
THORACIC SURGEON

WALTER SOMERVILLE
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ASSISTANT PHYSICIAN, DEPARTMENT OF CARDIOLOGY

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E. M. M. BESTERMAN
M.A., M.D. Camb., M.R.C.P.
SENIOR REGISTRAR
MIDDLESEX HOSPITAL

ATRIAL septal defect (A.S.D.) is the most frequent single congenital malformation of the heart encountered in clinical practice, yet its clinical diagnosis has only been accomplished during the past twenty years. In 1875 Rokitansky gave a masterly account of the pathological anatomy of A.S.D. and its embryological basis, distinguishing two main anatomical forms—namely, defects of the septum primum and of the septum secundum. Moreover, he stated explicitly that, in certain septum-secundum defects, the inferior vena cava opened partly or mainly into the left atrium, a fact which has been much ignored until surgeons became aware of it quite recently. The association of A.S.D. with mitral stenosis was described by Corvisart (1811) and later by Lutembacher (1916), whose name is now linked with this combined lesion.

Little was known of the clinical signs of A.S.D. until Assmann (1921) first identified its radiological features and thus paved the way to its clinical diagnosis. When Roesler, in 1934, analysed 62 recorded necropsy cases, only 1 of them had been correctly diagnosed during life (by Maude Abbott). Within the next few years, the clinical diagnosis was being made with assurance (Bedford, et al. 1941); but anatomical confirmation of the diagnosis, in this relatively benign lesion, was of necessity infrequent, and its distinction from various forms of pulmonary hypertension remained difficult. The advent of cardiac catheterisation has now provided a means of verifying the diagnosis of A.S.D. during life, and of elucidating its pathological physiology.

Thus the stage was reached when surgical correction of A.S.D. could be envisaged, and in 1947 Cohn suggested suturing the right atrial wall to the margins of the defect. In 1948 Murray, after experiments on dogs, closed an A.S.D. in a child by external suturing, and in 1952 Bailey introduced the operation of atrio-septopexy. Another method of closing the defect without opening the heart has been introduced by Sondergaard and modified by Björk and Crafoord (1953), and by Edwards et al, (1955). Direct suturing of the A.S.D. by opening the heart was introduced by Gross et al. (1953) using an "atrial well," but this did not allow visual control. Closure of the A.S.D. under direct vision with the heart open was first accomplished by Lewis and Taufic (1953) employing hypothermic anæsthesia, and this method has since been developed by Swan et al. (1953, 1955) and employed by Brock and Ross (1955) in this country and by Derra (1956) in Germany.

To anyone who has studied the anatomical complexities of A.S.D. the advantages of direct vision must seem decisive, and now that hypothermic anæsthesia has become safe (Swan and Blount 1956) we believe that open heart surgery is the method of choice in the closure of uncomplicated A.S.D.S.

The indications for surgical treatment have to be considered in relation to the anatomical variety of the A.S.D. and to the clinical findings and complications. Therefore we shall briefly review the clinical features and complications encountered in 100 consecutive cases of A.S.D. which we have investigated since commencing its surgical treatment at the Middlesex Hospital a year ago.

Anatomy of Atrial Septal Defect

It is essential to relate the septal defect to the main anatomical landmarks visible within the right atrium—namely, the two caval openings, the eustachian valve, the orifice of the coronary sinus, and the tricuspid valve. Unfortunately, all of these can rarely be identified in published pathological figures, but Rokitansky's exquisite illustrations are an exception and his book is still our best guide to the anatomy of A.S.D. However, a purely embryological classification is inadequate for the surgeon, and the following anatomical classification is based on examination of pathological specimens, on published necropsy findings, and on the surgical experience of ourselves and others.

Atrio-ventricular defects. (Persistent ostium primum; endocardial cushion defect; partial common atrio-ventricular canal.) (Fig. 1B.)—This form of A.S.D. overlies the tricuspid orifice and is crescentic in shape, its base being formed by the upper part of the ventricular septum and the attached mitral and tricuspid valves. The aortic leaflet of the mitral and the septal leaflet of the tricuspid valve are often cleft and malformed, causing valvular incompetence. An associated ventricular septal defect is common, as Rokitansky showed, and there may be a common atrio-ventricular (A-V) canal.

Fossa-ovalis defects. (Persistent ostium secundum.)—The normal fossa ovalis is bounded above by a muscular annulus and its floor is covered by a membrane or so-called valve which may be partly or wholly defective, or fenestrated. Small defects occupy the upper part of the fossa ovalis, but larger defects may extend to the orifice of the inferior vena cava; in 8 of Rokitansky's cases the inferior vena cava opened either into both atria equally, or mainly into the left atrium. When the A.S.D. lies astride the inferior caval orifice its anterior limb may be continuous with the eustachian valve which thus forms the lower margin of the defect (fig. 1E). In such cases, if the anterior and posterior margins of the defect are sutured together at operation, the vena cava will be shut off from the right atrium and so will communicate only with the left atrium. The following forms of fossa ovalis may be recognised:

(*a*) Defects of the upper part of the fossa ovalis below the annulus (widely patent foramen ovale) (fig. 1C).

(*b*) Large fossa-ovalis defects surrounded by a complete margin of atrial septum, and separated from the inferior caval orifice (fig. 1D).

(*c*) Defects astride the inferior caval orifice which thus opens into both atria or mainly into the left atrium if there is a large eustachian valve (fig. 1E). Occasionally small defects overlie the caval orifice leaving the fossa ovalis intact (Hickie 1956).

(*d*) Large fossa-ovalis defects in which the posterior septal rim is lacking or rudimentary, so that the right pulmonary veins communicate virtually with both atria (fig. 1F).

Superior-caval defects. (Sinus-venosus defect; high defect.) (Fig. 1G.)—These are located immediately below and adjacent to the orifice of the superior vena cava, and above and separate from the fossa ovalis which may be intact or may contain a second defect. Anomalous right pulmonary veins may open into the superior vena cava or into the right atrium adjacent to the septal defect.

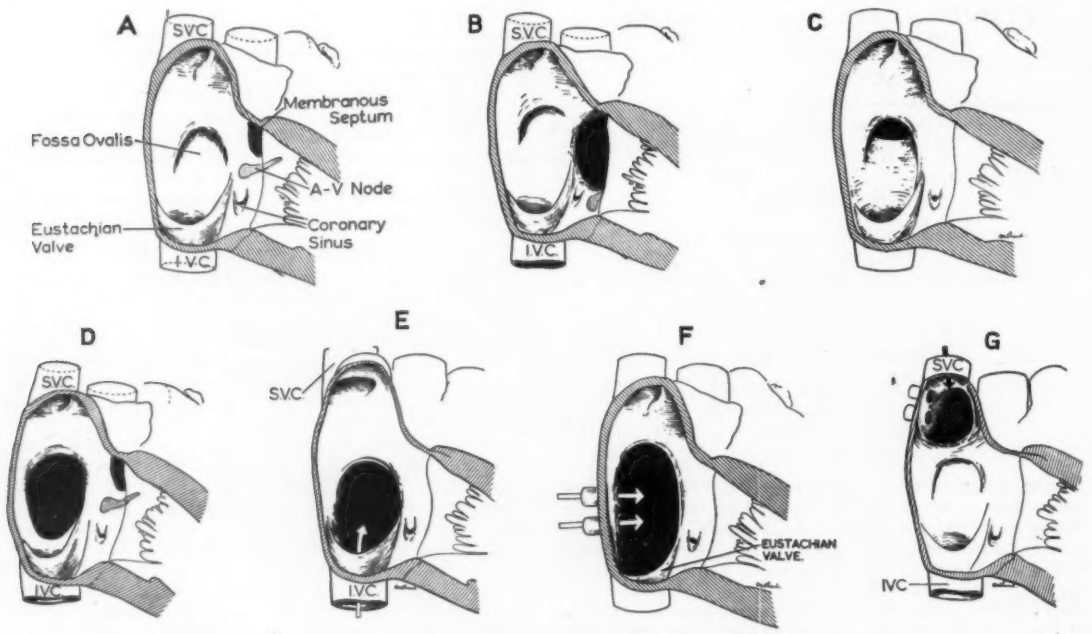


Fig. 1—Anatomy of atrial septal defect, viewed from right atrium.

(A) Normal atrial septum. (B) A-V type of defect. (C) Widely patent foramen ovale. (D) Fossa-ovalis defect with complete septal rim. (E) Low fossa-ovalis defect astride inferior caval orifice with large eustachian valve. (F) Large fossa-ovalis defect without any posterior septal rim; pseudo-anomalous right pulmonary veins. (G) Superior caval type of defect, showing entrance of right upper pulmonary veins.

This type of A.S.D. is probably less common than the A-V type; it was found once in 10 necropsies reported by one of us and was diagnosed in 3 of our 100 clinical cases. It has been fully described by Hudson (1955), by Lewis et al. (1955), and by Ross (1956).

Combination of defects.—The three main anatomical types may occur in combination; thus an A-V defect or a superior caval defect may be associated with a fossa-ovalis defect, or a single large defect may extend from the superior to the inferior caval orifice.

Physiology

In uncomplicated cases, blood is shunted from the left to the right atrium so that the output of the right ventricle is increased, and the pulmonary blood-flow usually reaches two to four times the systemic flow which is normal or slightly reduced. As long as the vascular resistance in the lungs remains normal, the pulmonary arterial pressure does not rise appreciably unless the pulmonary flow is very large, when a moderate degree of hyperkinetic pulmonary hypertension results. Obstructive pulmonary hypertension, due to an increased resistance in the small arteries, or to thrombosis of the larger arteries, or both, occurred in 15% of our cases. As the vascular resistance rises, the shunt through the A.S.D. is reduced, balanced, or sometimes reversed. A bidirectional or reversed shunt is recognised by the appearance of central cyanosis, by the clinical signs of pulmonary hypertension, and by a reduced arterial oxygen saturation.

Cardiac catheterisation was performed in 87 of our 100 cases, including all those submitted to surgery. The diagnosis of A.S.D. was confirmed by (*a*) a significant increase in oxygen saturation of blood samples from the right atrium and beyond compared with those obtained from the superior vena cava; (*b*) easy and usually repeated passage of the catheter from the right into the left atrium through the septal defect, accomplished in 50 cases.

Estimation of the actual shunt through the defect must be regarded at the best as an approximation. In 83 cases, the calculated pulmonary blood-flow was less than twice the systemic in 9, twice or more in 39, thrice in 21, and four times or more in 5 cases. In 9 cases the shunt was balanced or reversed, and the arterial oxygen saturation reduced (63–89%). The pulmonary arterial pressure, recorded in 85 cases, was below 30 mm. systolic in 59 cases, 30–50 mm. in 15 cases, and over 50 mm. in 11 cases in which the vascular resistance was elevated. Anomalous pulmonary veins entering the right atrium or superior vena cava, or both, were demonstrated by catheterisation in 10 cases (11%).

Incidence

Wood (1956) found A.S.D. in 18% of 900 cases of congenital heart-disease investigated, of which it was the most frequent single lesion. In regard to sex incidence, females predominated and constituted 69% of our cases. In the past, A.S.D. was not often diagnosed until adult life, but today it is more frequently recognised in childhood often at routine radiography, and 57% of Wood's patients were under twenty. A recent paper entitled Atrial Septal Defect in the Aged (Coulshed and Littler 1957) indicates that it is occasionally compatible with longevity. The ages of our patients were:

Age (years)	1–9	10–19	20–29	30–39	40–49	50–59	60–69
Cases	11	23	28	12	13	9	4

Clinical Diagnosis

The usual clinical signs of A.S.D. are now well established (Bedford et al. 1941, Barber et al. 1950, Leatham and Gray 1956) and therefore need only be enumerated briefly. The cardiac impulse is of right ventricular type and often displaced to the left, there is a systolic lift over the outflow tract of the right ventricle and pulmonary artery, and in 20% of our cases there was a pulmonary systolic thrill. The stethoscope reveals a pulmonary systolic murmur loudest in mid-systole, sometimes a systolic ejection sound, and an obviously split second sound which varies little with respiration. A diastolic murmur of relative pulmonary incompetence was heard in 20% of our cases and occurred when the pulmonary artery was grossly dilated or when there was pulmonary hypertension. A short delayed tricuspid diastolic murmur was present in over half of our cases, and is due to an increased flow through the tricuspid valve. The pulmonary systolic murmur is often audible at the apex. The pulse is small or normal in volume, and the blood-pressure normal or rather low.

Radiological findings include enlargement of the right atrium and ventricle, dilatation of the pulmonary trunk and main branches, and pulmonary plethora. The aorta is usually small and the aortic knuckle may be invisible in the anterior view. Exaggerated pulsation of the right ventricle and pulmonary trunk, sometimes accompanied by a hilar dance, is valuable evidence of a large shunt. Calcification of the hilar branches was seen in 4 of our cases and in 3 a dense immobile right branch indicated thrombosis.

The electrocardiogram showed partial or complete right bundle-branch block in 72 cases, and right ventricular hypertrophy without bundle-branch block in 18 cases. In 8 cases the electrocardiogram was unusual, showing left axis-deviation in 7, and right axis-deviation combined with left ventricular hypertrophy in the chest leads in one case. In 2 cases the electrocardiogram was normal.

Clinical Diagnosis of Atrio-ventricular (Ostium-primum) Defects

An A-V type of A.S.D. may be associated with malformed mitral and tricuspid valves, with a ventricular septal defect, or with a common atrioventricular canal, and it is mainly by these complications that it can be recognised. Its surgical repair is hazardous and usually needs more time than is available under hypothermia, so that its clinical recognition has become a major diagnostic problem.

The A-V defect is not common, for it was found only once in 10 necropsies by Bedford et al. (1941), and in 5 cases, verified by operation or necropsy, out of 85 cases investigated by Blount et al. (1956); and its incidence at operation in America has been estimated at 10–15% (Brandenburg and DuShane 1956). We made the diagnosis of an A-V type of defect in 13 of our present 100 cases, and so far we have successfully excluded it in all cases submitted to surgery.

Generally the heart enlarges early, symptoms appear in childhood, and pulmonary hypertension is common. Those with a common A-V canal usually die in infancy or childhood, but those with less complex types of lesion may attain adult life. Rogers and Edwards (1948) mention 5 patients who survived the age of thirty; Bedford et al. (1941) a patient aged forty-four, and Cahen et al. (1952) one aged forty-nine; and one of Rokitansky's attained the age of sixty-one. So an A-V type of defect cannot be excluded by age.

The diagnosis has been discussed by Cahen et al. (1952), by Blount et al. (1956), by Brandenburg and DuShane (1956), by Toscano-Barbosa et al. (1956), and by Wakai et al. (1956). In any case of A.S.D., an A-V type may be suspected on one or more of the following grounds: (1) unusual cardiac enlargement in childhood; (2) physical underdevelopment and mongolism; (3) pulmonary hypertension occurring below the age of twenty; (4) pansystolic murmur of mitral (or tricuspid) incompetence; (5) evidence of left ventricular hypertrophy in the electrocardiogram; (6) a left-to-right shunt at both atrial and ventricular levels; (7) bacterial endocarditis; (8) complete heart-block.

The most characteristic clinical finding is a loud pansystolic murmur, sometimes with a thrill, heard at the apex or left sternal edge, and due to mitral or tricuspid incompetence, or possibly to a ventricular septal defect. There may be both systolic and diastolic murmurs, in which case mitral stenosis is simulated: the term *faux syndrome de Lutembacher* has been coined (Cahen et al. 1952). A left ventricular thrust may be appreciable at the apex-beat. Bacterial endocarditis occurred in 1 of our cases and in 3 of those analysed by Rogers and Edwards (1948), whereas it is exceptionally rare in fossa-ovalis defects.

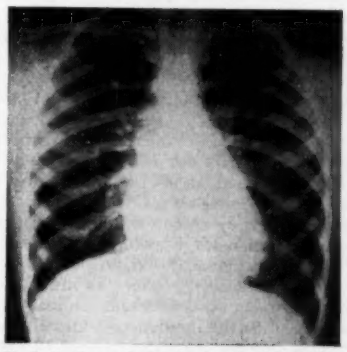


Fig. 2—Radiograph showing localised dilatation of superior vena cava in case of high atrial septal defect.

The electrocardiogram showed left-axis-deviation and horizontal heart pattern in 7 cases, in 5 of which there was also partial right bundle-branch block in the chest leads. In 2 cases the chest leads showed left ventricular hypertrophy as reported by Blount et al. (1956). A prolonged P–R interval is common; left bundle-branch block and complete heart-block have also been reported (Cahen et al. 1952).

Cardiac catheterisation may suggest a low atrial shunt, a shunt at both atrial and ventricular levels, or (we believe) a shunt mainly at ventricular level. The catheter may pass readily into the left ventricle and its track through the A.S.D. is said to be peculiar, though this should be interpreted with caution.

Diagnosis of Superior Caval Defects

Radiographs may show a localised dilatation of the superior vena cava just above the right atrium (fig. 2). Cardiac catheterisation may show arterialised blood in the superior vena cava compared with samples from the innominate vein, or samples from the upper part of the right atrium may be more oxygenated than those from the lower part. Sometimes the catheter can be passed directly from the superior vena cava into a pulmonary vein (fig. 3).

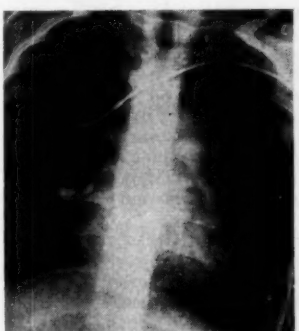


Fig. 3—Radiograph showing catheter passing from superior vena cava into right upper pulmonary vein in case of high atrial septal defect.

Complications of Atrial Septal Defect

Obstructive pulmonary hypertension occurred in 15 of our

100 cases, in 7 of which the shunt was reversed, in 3 balanced, and in 5 from left to right. 2 with thrombosis and calcification of large pulmonary branches were not catheterised, and in another cyanosed patient the diagnosis was made by angiocardiography. The pulmonary systolic pressures ranged from 50 to 118 mm. Hg, and the vascular resistances from 3·5 to 38 units (1 unit = 80 dynes per sec. per cm.$^{-5}$). All showed clinical signs of pulmonary hypertension. 2 patients were under twenty years of age and both probably had A-V defects. 4 were between twenty and thirty, 3 between thirty and forty, and 6 over forty years. Only 1 patient was submitted to surgery, namely a woman aged forty with a pulmonary systolic pressure of 75 mm. and a vascular resistance of 3·5 units, but there was a 4 : 1 shunt from left to right and the hypertension was mainly hyperkinetic.

Pulmonary stenosis.—Wood (1956) found mild pulmonary stenosis in 10–15% of all cases of A.S.D., and it was diagnosed clinically or suspected from catheter findings in 11 of our 100 cases, in 2 of which the diagnosis was confirmed at operation. However, we are sceptical of the diagnosis of mild pulmonary stenosis, based on a pressure gradient across the pulmonary valve, in cases of A.S.D. with a large pulmonary flow when a condition of "relative stenosis" exists.

Mitral stenosis.—There is much discrepancy between post-mortem statistics and clinical or surgical experience in regard to the incidence of mitral stenosis in A.S.D. Thus mitral stenosis occurred in 4 of 10 necropsies but in only 4 of 43 clinical cases of Bedford et al. (1941), and Burrett and White (1945) estimated its incidence as over 50% of all cases of A.S.D. at necropsy. It was diagnosed on clinical or other grounds in 6 of our 100 cases of A.S.D., in 3 of which the diagnosis was confirmed at operation.

Atrial fibrillation was present in 10 of our cases, in 1 of which it developed after operation. 5 of them had mitral stenosis, and all were over the age of forty except 1 with mitral stenosis aged twenty-four.

Anomalous pulmonary veins opening into the right atrium or superior vena cava were recognised in 10 of our 100 cases at catheterisation and once at operation. In 1 case where a right pulmonary vein was thought to open into the right atrium at catheterisation, it was found at operation to be just on the left side of the small posterior septal margin of the A.S.D. It is especially in the high superior caval defects that anomalous right pulmonary veins are of surgical importance. We are not considering here total anomalous pulmonary venous drainage which, of course, is invariably associated with an A.S.D.

Clinical Course

According to post-mortem statistics, the average age at death is between thirty-six and thirty-seven years (Burrett and White 1945), over half surviving the age of forty. In A.S.D. complicated by mitral disease, Bouvrain and Sibille (1954) give the average age at death as forty years.

Although A.S.D. is a congenital lesion, its consequences are acquired and develop gradually over the course of years as a result of the right heart being overloaded. In uncomplicated cases, cardiac symptoms are usually mild or absent up to the age of twenty, after which some cardiac enlargement is common, and a grossly enlarged heart was found in 20% of our cases aged between twenty and forty, and in 60% of those over forty.

Congestive heart-failure occurred in 15 cases, 3 of them under thirty, and the remainder all over forty. 5 of these have already been operated on, and another may become fit for surgery, but the rest are unsuitable because of their age and general condition, or of complications.

To summarise, serious cardiovascular changes begin to develop after the age of twenty, and after the age of forty gross cardiac enlargement is present in over half.

Indications for Surgical Treatment

With a heart lesion whose course is benign up to the age of twenty and sometimes even up to the age of forty the indications for surgical treatment are obviously related to the operative risk. Wood (1956) expresses this view as follows: "Until the mortality is under 5%, uncomplicated cases with 2 : 1 shunts should certainly be left alone." Accepting this view, we believe that today the operative mortality in uncomplicated cases should not exceed 5% at a centre dealing with a large number of cases and where a safe hypothermic technique is in routine use.

It is true that published statistics indicate an overall operative mortality of about 10% for fossa-ovalis defects; but these statistics are already out of date, and in properly selected cases the operation has now become far safer. In A-V defects, of course, the operative mortality is much higher (probably over 50%), and we have not attempted to close them under hypothermia.

The proper time to close an A.S.D. is surely before the right ventricle and pulmonary vasculature have become irreversibly damaged, so that normal function may be restored to a relatively intact heart. We believe, therefore, that uncomplicated fossa-ovalis defects with a shunt of 2 : 1 or more should be closed as soon as the diagnosis is established and preferably before the age of twenty, even in the absence of cardiac symptoms. In practice, we are often faced with the problem of older patients with advanced heart-disease, or even heart-failure, and these patients have to be operated on unless there are contra-indications to surgery.

Mitral stenosis is no contra-indication to closure of an A.S.D. provided that the stenosis is relieved at the same time by valvotomy, and we have performed this combined operation in 3 cases with excellent results. Slight pulmonary stenosis is likewise no bar to closing an A.S.D., and if necessary a valvotomy can be done at the same time.

Pulmonary hypertension of hyperkinetic type, due to a large flow and without a seriously elevated vascular resistance, is no contra-indication, but obstructive pulmonary hypertension is another matter. When the shunt is balanced or reversed, closure of an A.S.D. can only do harm. Even when the shunt is still from left to right, closure of an A.S.D. in the presence of serious pulmonary vascular disease removes the safety-valve action of a potential right-to-left shunt during exertion and virtually reproduces a state of primary pulmonary hypertension. Surgical experience indicates that closure of an A.S.D. complicated by obstructive pulmonary hypertension is hazardous (Bolton et al. 1957; Blount, personal communication), and we believe that the reward is unlikely to be great. When an A.S.D. is associated with systemic hypertension, as happens occasionally in older patients, its closure is likely to lead to left heart-failure and is therefore, we believe, contra-indicated.

The A-V type of A.S.D. is a complex anatomical lesion and its surgical repair is not only hazardous but must usually require more time than is available under hypothermia. Atrio-septopexy has proved unsuccessful in this type of defect (Bolton et al. 1957); so its closure requires open heart surgery by means of an artificial circulation. Closure of high superior caval defects under hypothermia has been described (Lewis, et al. 1955, Derra 1956) but we have not yet attempted it.

To sum up, our contra-indications to closing an A.S.D. under hypothermia are at present: (1) A-V type of defect; (2) reversed shunt with cyanosis; (3) obstructive pulmonary hypertension with high vascular resistance; (4) systemic hypertension; and (5) advanced age and poor general condition. On one or more of these grounds 39 of our 100 cases of A.S.D. were rejected as unsuitable for surgery.

Surgical Experience

Closure of an A.S.D. by open heart surgery under hypothermia has been performed during the past year at the Middlesex Hospital in 40 patients (28 female and 12 male) aged six to fifty-five years :

Age (years)	1–9	10–19	20–29	30–39	40–49	50–59
Cases	6	8	16	3	6	1

The heart was grossly enlarged (cardio-thoracic ratio over 60%) in 8 cases, considerably enlarged in 10 cases, and in the remainder moderately or slightly so, the right atrium being mainly involved. 5 patients had congestive failure before operation, and 3 had atrial fibrillation. Shunts, calculated in 38 cases, were less than 3 : 1 in 21 cases, 3 : 1 or more in 14, and 4 : 1 or more in 3. The pulmonary arterial systolic pressure was normal in 32 cases, 30–50 mm. in 6 cases, and 75 mm. in 1 case. The pulmonary vascular resistance was normal in all but 2 cases where it was slightly elevated.

All those submitted to operation had fossa-ovalis defects separated from the tricuspid valve, though some very large defects extended beyond the normal confines of the fossa ovalis, reaching the inferior caval orifice in 9 cases, and also the superior caval orifice in 2. There was no posterior septal residue in 2 cases.

Hypothermic Anæsthesia

This was administered by Dr. Sellick in all cases, employing surface cooling and following the method developed by Virtue in Swan's clinic, with certain modifications (Sellick 1957). The important points in our technique are that an œsophageal temperature of 30°C at the time of circulatory arrest is regarded as ideal, and that rewarming by plastic water blankets is started as soon as the patient leaves the cold bath. This degree of cooling permits circulatory arrest for at least seven minutes with safety and probably for a maximum period of ten minutes. Neostigmine is injected into the coronary circulation via the proximal aorta before opening the heart and this we believe to be an important protection against ventricular fibrillation.

During hypothermia the heart-rate was usually slow (about 40). Atrial arrhythmias were common and complete heart-block was sometimes encountered, but ventricular fibrillation occurred only twice and was due in both cases to technical errors. In one it was brief and responded at once to electrical defibrillation ; in the other it occurred when the heart was open and the circulation arrested, so that it could not be dealt with until closure of the A.S.D. had been completed, when it responded to electrical defibrillation combined with transfusion of blood directly into the right ventricle.

Surgical Technique

The patient is removed from the bath after cooling to 31–32°C (œsophageal temperature) and placed supine on the operating-table, lying on and also covered by plastic water blankets through which water at 40°C is circulated by a pump. Even with immediate rewarming, the temperature continues to drop another 0·5–2°C, and the maximum drop to about 30°C is timed to coincide as near as possible to the period of circulatory arrest. Lower temperatures are unnecessary and predispose to dangerous ventricular arrhythmias.

We have largely followed the technique introduced by Swan of suturing the defect under direct vision through the open right atrium during temporary arrest of the circulation. Simple suture is sufficient to maintain closure; for, once the shunt has been eliminated, the tense and distended right atrium becomes retracted and flaccid so that the suture line is not under tension or likely to cut out.

Operation

A bilateral thoracotomy is used for exposure of the heart. A long transverse incision is made from one axilla to the other across the chest in the submammary region. The skin and underlying muscles are retracted to expose the fourth intercostal spaces and the pleural cavities are opened through these intercostal muscles. Internal mammary arteries are secured between ligatures and the sternum cut across before opening up the incision with rib spreaders at each end of the wound.

The extrapericardial fascia and fat is divided and dissected free to the upper limit of the pericardium which is then opened along its left border and across the lower border as far as the level of the right phrenic nerve. This triangular flap of pericardium is retracted to the right and sutured over the lung. The superior vena cava is then encircled by a tape below the level of the azygos vein, a procedure which involves incision of a posterior pericardial fold which lies just in front of the right pulmonary artery. The inferior vena cava is similarly controlled by a tape after incision of the pericardium where it is reflected on to the diaphragm. The tapes are threaded through lengths of rubber tubing which, when pressed downwards, can act as tourniquets. A special clamp is then placed with one blade through the transverse sinus and the other lying across the base of the pulmonary artery and the aorta (fig. 4). A small incision is made into the lateral wall of the right atrium and the bare index finger inserted into the heart. The edges of the defect are explored and the presence and size of the eustachian valve estimated. The finger is passed through the defect into the left atrium where the mitral valve can be palpated ; should it be stenosed, valvotomy is carried out. Next, the finger is passed through the tricuspid valve and through the right ventricle into the pulmonary outflow tract. In nearly every case it is possible to feel the pulmonary valve itself and estimate any stenosis. The atrial wall is clamped as the finger is withdrawn and the incision enlarged within the confines of the clamp to $2^1/_2$–3 inches.

The heart is occluded from the circulation by tightening the tape tourniquets completely on both venæ cavæ, after which it is allowed to beat 10–20 times to empty itself of blood before the arterial clamp across the aorta and pulmonary artery is closed. Neostigmine, 0·03 mg. per stone (14 lb.) body-weight, is then injected into the aorta proximal to the clamp so that it reaches the coronary circulation, and the clamp is then shifted downwards

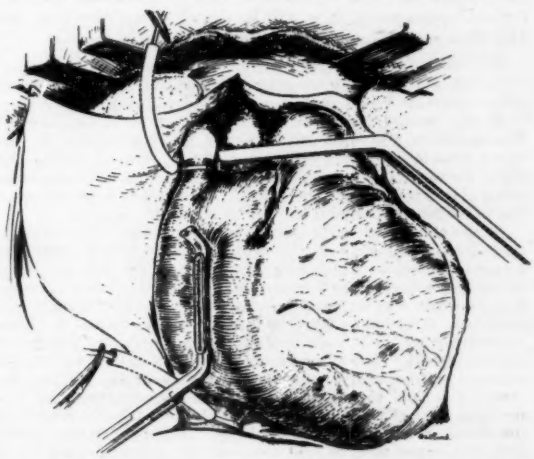
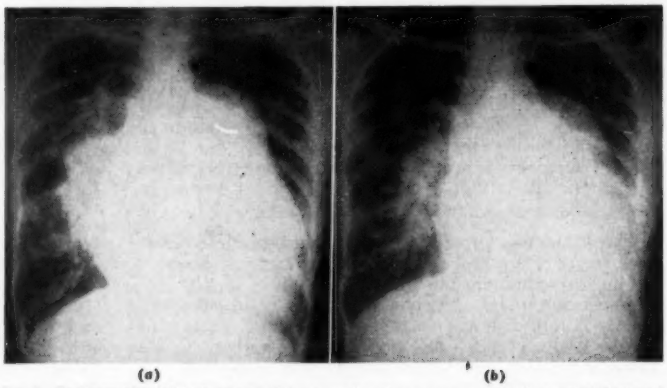


Fig. 4—Method of arresting the circulation by tape tourniquets round both venæ cavæ and a clamp across aorta and pulmonary artery. Incision in right atrium controlled by clamp.

to occlude the orifices of the coronary arteries. The right atrial clamp is now removed and a quantity of blood gushes out which is sucked away while the edges of the atrial incision are retracted. Continuous suction is required to keep the atrium free of blood so that the septum is visible. The lower margin of the defect is then picked up by a suture (000 plastic or silk suture), and, using traction on this first stitch, the suture is continued upwards to the upper end of the defect; any bands or Chiari network can be included in the suture. The end of this continuous suture is tied to a separate suture and two or three small interrupted reinforcing stitches are added.

Before closure of the defect is completed, the anæsthetist inflates the lungs and distends the left atrium with blood, so excluding all air from the left heart. The right atrium is then filled with Ringer's solution and one of the caval tourniquets is released. As the right atrium quickly fills with blood, the edges of the incision are held upwards and clamped when all air has been expelled. The second caval tourniquet is released and the clamp on the great arteries is removed. The heart, which has been blue for some minutes, becomes pink in patches and as the circulation is restored rapidly regains its normal colour. The incision in the right atrial wall is closed by continuous suture. The pericardium is loosely closed and the chest incision is sutured after insertion of closed drainage tubes into each pleural cavity.



(a) (b)

Fig. 5—Radiographs (a) before and (b) six weeks after closure of atrial septal defect and mitral valvotomy. Female aged 40 with Lutembacher syndrome. Note diminution in size of right atrium.

The operation in most cases has been straightforward and the defect has usually been closed in four to five minutes. Difficulties may occur in the case of low defects astride the inferior caval orifice without any lower septal rim. If the defect is closed from above, a lower border or ridge is produced which overlies the caval orifice so that it communicates with both atria. The lower edges of the defect must be sutured to the posterior margin of the caval orifice or to the adjacent floor of the left atrium so as to direct the caval flow into the right atrium. Another problem arises if the lower border of the defect is formed by a large eustachian valve which is continuous with the anterior limb of the defect and merges into the posterior atrial wall (fig. 1E). If the valve is included in the suture line, the defect will have been closed but the inferior vena caval flow will be directed entirely into the left atrium, causing central cyanosis.

This happened in 3 of our cases.

In the first, nothing unusual was noticed until some time after operation when central cyanosis developed.

In the second, cyanosis was recognised on completion of the operation, the chest was reopened, and the circulation was again arrested for four minutes at 33°C. On reopening the right atrium, the eustachian valve was found to have been sutured into the edges of the defect. The stitches were removed, the valve cut across, and the defect was then reclosed.

In the third case, after closure of a very large defect a postoperative examination of the arterial blood showed a reduced oxygen saturation suggesting that some of the inferior caval blood was entering the left atrium. A second operation under hypothermia was undertaken later, and the right atrium was explored. It appeared that the inferior vena cava had not been excluded from the left atrium, and the lower end of the defect was resutured. However cyanosis persisted and seemed to be relieved by temporary occlusion of the vena cava. The inferior vena cava was therefore divided and transplanted into the anterior wall of the right atrium, but the patient's condition deteriorated and death resulted. At necropsy, it was found that the upper sutures had stenosed the superior vena caval orifice and directed it partly into the left atrium.

In order to overcome some of the technical difficulties in cases of low defects, an obturator has been designed for insertion into the inferior caval orifice, which is thus held open instead of being buckled or narrowed by the tape tourniquet. The eustachian valve is held anteriorly so that the lower edge of the defect can be more accurately defined. This manœuvre is now carried out in all cases where the defect lies astride the inferior caval orifice and where a eustachian valve is palpated at preliminary digital exploration.

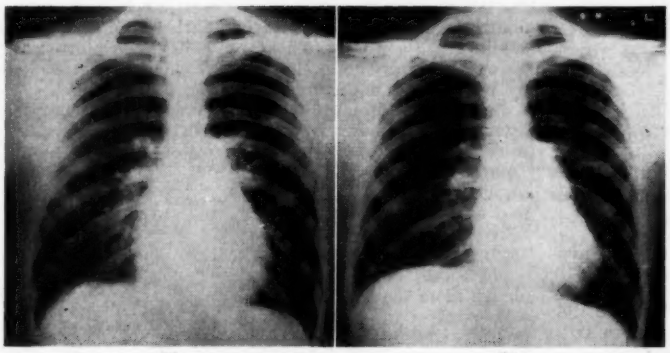
Postoperative Complications

Apical pneumothorax occurred in 10 cases but has now been avoided by the routine use of apical drainage tubes. Small pleural effusions, mainly on the left side, developed as a rule but always resolved spontaneously. Pericardial and pleuro-pericardial friction usually persisted for seven to ten days after operation. In one patient the rub persisted for three weeks with some pyrexia, and in another a febrile episode resembling the mitral post-valvotomy syndrome occurred two months after operation. Partial collapse of the left lower lobe occurred in 4 cases, paralysis of the left diaphragm in 1, and a transient Horner's syndrome was observed twice. Postoperative abdominal pain, sometimes accompanied by nausea and vomiting, and suggestive of mild ileus occurred in 4 cases and these symptoms have been reported by others. Cerebral symptoms occurred in 2 cases, one described later, and also in the last patient to be operated on who is improving.

Postoperative arrhythmias were recorded in 15 cases—namely, atrial fibrillation in 3, atrial flutter in 3, ectopic supraventricular tachycardia in 6, and nodal rhythm in 3 cases. Sinus rhythm was restored in all but 2: in one with a very large heart fibrillation has persisted, and in another recent case flutter is still present.

Results

There was no operative or postoperative mortality apart from the one fatality, after a second operation, already described. The immediate benefit to those with very large hearts and heart-failure or serious cardiac symptoms was remarkable. Failure disappeared, effort tolerance increased, and the heart became much quieter. There has also been a gain in weight and improvement in general health in poorly nourished patients. In those without seriously enlarged hearts, the benefit of closing the A.S.D. can be assessed only in future years, but most of them are less conscious of an overactive heart and feel better. There is every reason to expect that restoration of normal cardiac function will prevent the progressive cardiac and arterial changes which usually occur in older patients, and that their expectation of life has been prolonged.



(a) (b)

Fig. 6—Radiographs (a) before and (b) six months after closure of atrial septal defect. Male aged 20.

There were two unsatisfactory results in which, as already stated, the inferior caval blood was deflected into the left atrium in closing low septal defects.

In one, a boy aged 15, nothing untoward was noticed until after operation when there was a transient cerebral disturbance followed by tachycardia. Four months later, there was slight central cyanosis and clubbing of the fingers, and pyrexia due to infected tonsils. Following tonsillectomy, an angiocardiogram was performed, contrast medium being injected through a catheter into the inferior vena cava. This showed that most of the inferior caval blood entered the left atrium. The patient is now convalescing from tonsillectomy after which it is planned to operate again and resuture the A.S.D.

The second case has already been described.

Postoperative cardiac catheterisation has so far been performed in 12 cases. In 7 of them catheter findings were completely normal and in 3 of them compatible with an insignificant residual shunt. In 2 cases appreciable shunts persisted; in one a shunt of 9 litres per minute was reduced to 3 litres, and in the other an 11-litre shunt to 4·5 litres. Curiously enough the last patient was the one who showed most dramatic benefit from operation. Before it, she had a very large heart and was completely incapacitated by failure; but her heart became much smaller and she is now back in full-time employment. Anomalous pulmonary veins, recognised at operation in this case, were directed into the left atrium, but others may have been overlooked.

Postoperative Clinical Signs

The most obvious change was that the overactive heart became much quieter; the right ventricular systolic lift diminished or disappeared and the apical impulse became less forcible. A pulmonary systolic thrill, present before operation in 7 cases, always disappeared and the systolic murmur diminished or sometimes disappeared. Splitting of the second sound usually became closer or confined to inspiration, but in 10 cases wide splitting persisted unchanged. The tricuspid diastolic murmur always disappeared, but a mitral diastolic persisted in 3 cases with mitral-valve disease. A pulmonary systolic ejection sound when present always persisted, and in 9 cases it only appeared after operation. It was difficult to compare heart size in preoperative and postoperative chest films, owing to cardiac displacement and a higher level of the diaphragm postoperatively; but large hearts became obviously smaller and the right atrium was always less prominent (figs. 5 and 6). Changes in the electrocardiogram often indicated a diminution of right ventricular predominance in chest leads V1 and V6.

Summary and Conclusions

The anatomy of atrial septal defects is described with special reference to their surgical repair.

The clinical features, hæmodynamic findings, and complications in 100 consecutive cases of atrial septal defects are briefly given and the indications for and contra-indications to surgical treatment are discussed.

Uncomplicated fossa-ovalis (ostium-secundum) defects can be closed under hypothermia with little operative risk, and this should be done preferably before the age of twenty years, when the heart and pulmonary vessels are intact; but even after the age of forty, and when the heart is grossly enlarged, operation may still give good results.

Atrio-ventricular (ostium-primum) defects cannot safely be closed under hypothermia, and their clinical diagnosis is discussed. Obstructive pulmonary hypertension with a seriously elevated vascular resistance is regarded as being usually a contra-indication to surgical closure of an atrial septal defect.

The closure of atrial septal defects by open heart surgery under hypothermia is described and the results of operation in 40 cases are given. There was only one fatality, following a second operation undertaken to resuture the defect. In another case, an unsatisfactory result was due to deflection of the inferior vena cava into the left atrium. In the remaining cases the immediate results have been satisfactory.

We are indebted to numerous colleagues for referring cases of A.S.D. to us, especially to Dr. J. W. Brown and Dr. R. Kemball Price. Some of our cases were investigated at the National Heart Hospital and we are grateful to Dr. Paul Wood, director of the Institute of Cardiology, and to Dr. N. A. J. Hamer and other registrars for their valuable help and coöperation. We also wish to thank Mr. J. W. Jackson who has assisted at all operations, Mr. E. Bridger, chief cardiological technician, and Miss E. Hewland, medical artist, who have always been present in the operating-theatre.

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SLEEP AND WAKEFULNESS IN THE ARCTIC

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ON the British North Greenland Expedition of 1952–54 there was an opportunity to study the effect of the polar environment on the twenty-nine men who were exploring an area at about latitude 77° N, some 800 miles from the North Pole (Lewis and Masterton 1955). There were two laboratories, one at the edge of the inland ice at Britannia Sø, and the other (a smaller station "Northice"), almost 300 miles out on the inland ice and manned by three scientists.

There are two main climatic phenomena in the polar circles—the extreme cold, and the periods of light and darkness which are seasonal and not diurnal as in the lower latitudes. At 77° North there is a summer period of continuous sunlight and a winter period of darkness, each lasting about 3 months.

The effect of the environment was studied on the sleep pattern of men used to a diurnal cycle, observations being made on the number of hours slept over the seasons, the effect of specific duties, and the relationship of disturbed sleep to the taking of naps. In this study artificial situations were not imposed experimentally, the records being made in natural surroundings.

Each member of the expedition was issued with a specially printed sleep-card (fig. 1) which he filled in daily. At the end of every month the completed card was exchanged for a new one, and at the end of the expedition the information was transferred to a punch-card system and the results extracted, each month being adjusted to 31 days. Sleep/wakefulness patterns were plotted for groups and individuals (fig. 2) after the method adopted by Kleitman and Engelmann (1953).

Periods of sleep not longer than 3 hours, and separated by at least 1 hour from the main sleep of the day, were defined as "naps." This implied that a nap was "sleep taken with the clothes on." It could usually be identified on the sleep-card as an isolated line. Interrupted sleep appeared on the cards as a discontinuous line on which the interruptions represented the time awake. Recording of either naps or interruptions was not difficult, for the cards were usually well-documented with regard to time, frequency, and suggested causes of sleeplessness. Examples are seen in fig. 1.

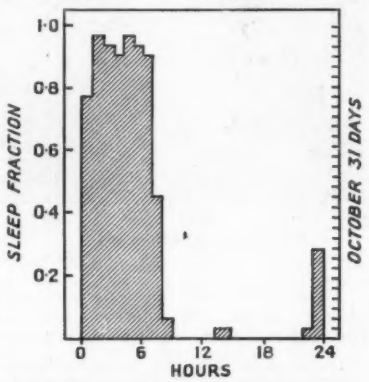

Fig. 2—Sleep/wakefulness pattern derived from the sleep-card (fig. 1). The hatched areas represent the fraction of the month spent in sleep. There is a steep descent of the line which separates sleep from wakefulness, and the hours after 0900 are not involved in sleep, except for the nap at 1300. (After Kleitman and Engelmann 1953.)

Results

The results are shown in figs. 3–9.

Total sleep.—In a group of five men whose sleep-cards were complete for 24 months, the mode was at 229 hours per month (7·4 hours sleep per night). If all available sleep-cards from the whole expedition were included, the mode was at 220 hours per month (7·1 hours per night) (fig. 3). The mean sleep of individual subjects was 7·9 hours per night (S.D. = 0·82). There was no relation between the age of the subject and his hours of sleep.

Time of awakening.—There was great variation in the time at which members awoke (calculated as a monthly mean). Greenwich Mean Time (G.M.T.) was observed throughout, the local noon being 1430 hr. G.M.T. In the first 2 months the time of awakening ranged between 0600 and 1000 hr., but as the winter proceeded the range increased until the month of January which showed the widest dispersal from 0800 to 1600 hr. In early spring the range contracted again, but in midsummer became large, from 0500 to 1300 hr. In the autumn there was contraction. The variations were considerably less in the second year, but the mean time of getting up was later—namely, nearer 1200 hr. Fig. 4 shows that the variation of awakening was due to the random time at which individual members awoke.

Time of going to sleep.—In the first two months the times of going to sleep were between 2100 and 0100 hr.;

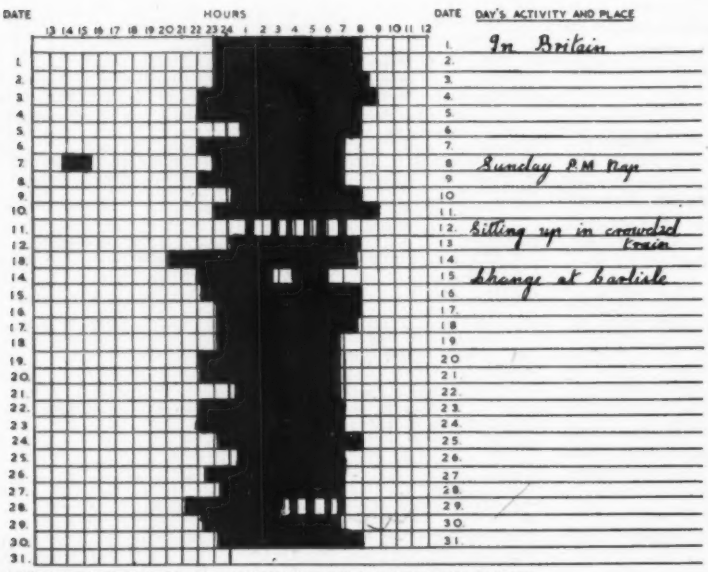
DATE
HOURS
DATE
DAY'S ACTIVITY AND PLACE
In Britain
Sunday PM Nap
Sitting up in crowded train
Change at Carlisle
SLEEP RHYTHM: PLEASE DRAW A LINE ACROSS PERIOD YOU SLEPT EACH 24 HOURS.
MEDICAL RESEARCH COUNCIL: DIVISION OF HUMAN PHYSIOLOGY. 1955.

Fig. 1—Sleep-card. This shows the typical distribution of sleep during a month for a man in the U.K.

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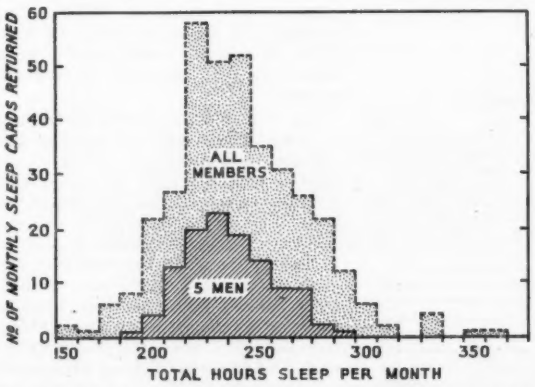

Fig. 3—Distribution of total monthly sleep of all members, and of a group of five whose cards were complete for 24 months.

with the onset of the winter this range widened, so that in January the mean times ranged from 1300 to 0300 hr. The range contracted in the spring, but in the summer it broadened again to 1900–0100 hr. The pattern was repeated in the second year.

Fig. 4 shows that the variation in the group was due to individuals' random time of going to sleep, likewise calculated as a mean time over the days of each month.

Effect of continuous darkness.—Sleep-wakefulness graphs, drawn for the group over the winter months, showed deviations from the conventional pattern illustrated by fig. 2. An example is the card shown in fig. 5.

Effect of continuous sunlight.—In the summer months there was rearrangement of sleep. An example is shown in fig. 6. As with the winter darkness, the total sleep per month was not appreciably altered.

Effect of specific duties.—Radio and weather observation were two duties at 0600 hr. Fig. 7 shows the differing sleep rearrangement in two men (A and B) who had to be awake at that time. As the season progressed, B (but not A) took the bulk of his sleep each night after the duty. A slept 1·4 hours longer than B (nightly average).

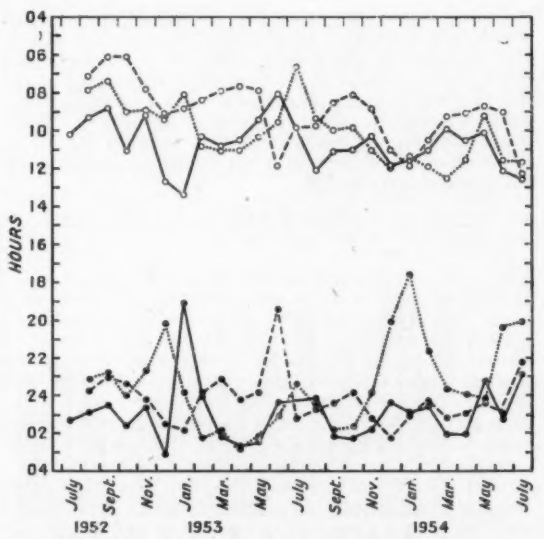

Fig. 4—Times of awakening and going to sleep for three individuals. Open circles represent times of awakening; closed circles times of going to sleep. The variation of the times for the group is seen here to be caused by variation in individuals' times.

Monthly variations.—As a group, the members slept longer in the first 12 months than in the second, a statistically significant difference of 0·4 hours a day; but this did not apply to individual subjects month by month for the 2 years.

There was also a slight though statistically significant difference between the months, the general tendency being for longer hours in the autumn and shorter in the spring (fig. 8). The pattern was repeated in the second year, though at a slightly lower level.

Interrupted sleep.—Fig. 9 shows the monthly mean number of interruptions for the group. There were fewest interruptions in August, 1952. Increases above the August level occurred in the winters of the 2 years. The increases were smaller in the summer months, except for July, 1952, which gave a mean of almost 36 interruptions per man, due to seasickness on the voyage to Greenland.

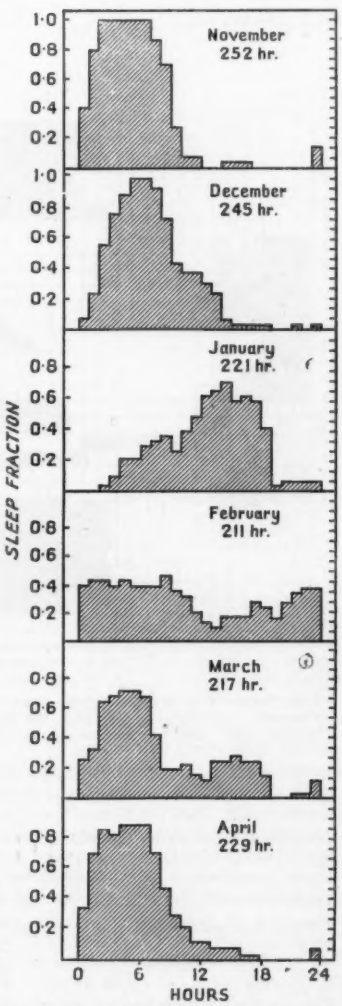

Fig. 5—Sleep/wakefulness graph for one member.

Naps.—The monthly mean for the expedition was lowest in August, 1952, and in September, 1953. There were peaks in mid-winter, especially January, when the number of naps per person per month was over 25 (fig. 9). In individuals, however, the taking of a nap did not closely follow nights of interrupted sleep.

Discussion

Living Arrangements

The cycles of sleep and wakefulness in man are determined largely by the influence of the community (Gesell and Amatruda 1945), which in turn has derived its pattern from the diurnal solar cycle of light and darkness. Apart from other considerations, it is economical—in the broadest sense—to sleep during the darkness and be active during the light hours.

This is a perfectly reasonable arrangement in almost all parts of the globe. In the polar regions, however, the period of light and darkness is not diurnal but seasonal.

Visitors to Northern Norway during the summer often comment that there is much activity in the streets in the broad daylight of midnight; but a careful study of the

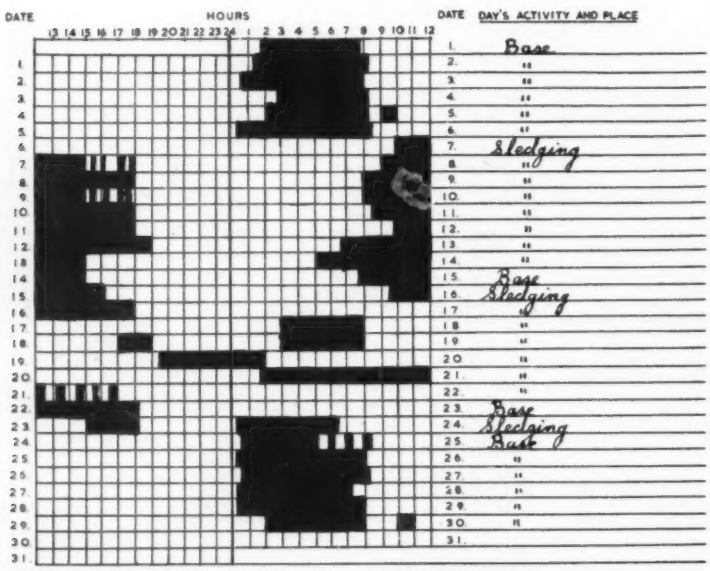

Fig. 6—Sleep-card for a member who slept mainly between midnight and 1000 at the base laboratory, but between 0800 and 1800 when sledging. He preferred to travel during the "night" when the snow surface was harder.

habits of the residents of Tromsø (Kleitman and Kleitman 1953) showed that this was not the case, and that in fact communally they did conform to the diurnal sleep/wakefulness pattern. The activity in the streets is usually associated with the departure of a ship, and soon afterwards the town is completely quiet, for they keep much the same hours as people in the rest of the civilised world.

There was confirmation of this when the ship of the British North Greenland Expedition arrived in Reykjavik, Iceland. It was broad daylight, and the members were surprised that the important harbour was so deserted and that the authorities did not immediately send a pilot when the siren was sounded. It was only then realised that the time was 2 A.M. and well out of normal working hours.

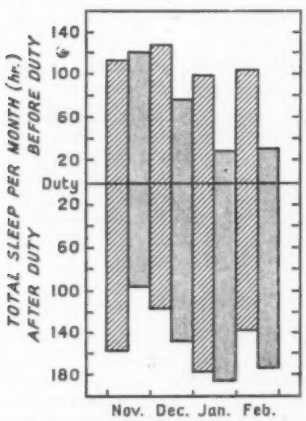

Fig. 7—Relationship of sleep in two members to the 0600-hr. meteorological duty at the Ice Cap Weather Station. A, winter, 1952 (hatched); B, winter 1953 (stippled). As the season progressed, B took the bulk of his sleep each night after the duty, but A kept to his earlier pattern. On average, A slept 1·4 hours longer each night than B.

It appears, therefore, that despite months of darkness and of light the diurnal pattern is maintained, since the community is organised on this pattern. But if there is little or no control by community habit it is interesting to observe what happens to the sleep/wakefulness pattern of members. This might represent a truer *physiological* state of affairs than the conditioned pattern which reflects rather a *sociological* picture.

On the British North Greenland Expedition the men did not live as a strictly organised community. As long as the scientific programme or domestic work of the day was done, there was no reason why one should not take sleep at any time during the 24 hours. Some of the scientific programme required attendance at definite times, such as the weather observation and radio, whereas others required work to be completed over a period of months without necessarily a daily routine. The medical research programme was carried out at times convenient for the other scientists, without interfering with their routines.

In the winter their activity consisted mainly in calibrating and checking apparatus indoors, though a few men spent 2–3 hours outside tending the dogs. Physiological research was probably most active at this time, since most subjects were under one roof. Except for fortnightly estimations of basal metabolic rate early in the morning, their sleep was not interfered with.

Conditions of sleep were comfortable at base. There were iron bedsteads, each of which was covered with sponge-rubber ($1/_2$ in. thick) and a sheepskin. Each man had two down sleeping-bags, and to make the beds more comfortable some slept on top of their spare sleeping-bags, or other soft material such as parachute cloth, unused clothing, or canvas.

On the trail the men put one sleeping-bag inside the other and lay on the sheepskin, which was placed directly on the snow. Inflatable air-mattresses were not popular, because of their undue springiness. During cold weather, perspiration condensed and froze in the sleeping-bags and sheepskins, considerably reducing their insulation; but the men slept well and only occasionally complained of sleeplessness due to cold.

During winter the men complained of sleeplessness which they attributed to comparative inactivity and to the stuffiness of the sleeping-quarters. Windows and doors were kept shut to preserve the warmth, and as the building was draught-proof the air was so stagnant that tobacco smoke remained in layers at about 7 ft. There was a temperature gradient of 10°C between the air at the level of the upper and lower bunks, the upper often being uncomfortably hot.

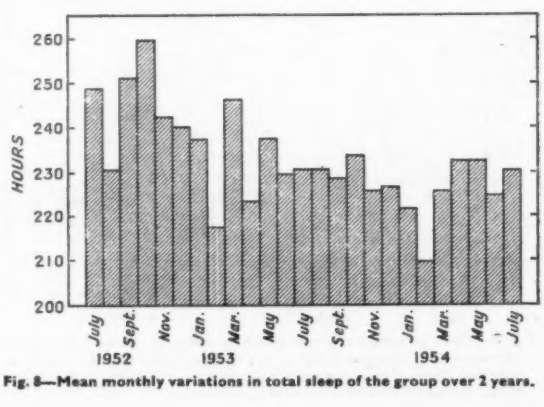

Fig. 8—Mean monthly variations in total sleep of the group over 2 years.

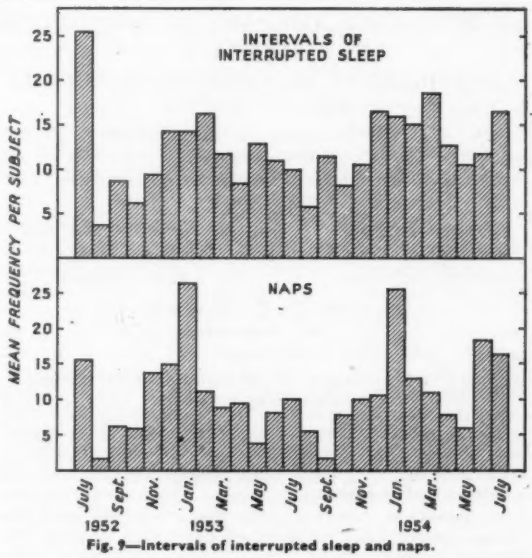

Fig. 9—Intervals of interrupted sleep and naps.

During the summer at the base laboratory complaints were made that the continuous sunlight made it difficult to sleep, even though there was outdoor physical work to tire the men. Some curtained the window of their bunks; others blindfolded themselves. One member asked for sleeping-tablets occasionally throughout the year, but this was not permitted. In spite of the complaints the total sleep of individuals was not significantly altered.

Cooking duty was the main domestic chore, and it involved two men for a week at a time. For the twenty other men the day began when the cook called them for breakfast. About a quarter were usually awake when he came round; of the others, half responded at the slightest touch and half needed violent shaking. Though mealtimes were set, this did not imply that the men had to be up and about after breakfast, and sometimes they went back to sleep—if they had been working late or celebrating the night before. There was little social pressure to encourage being up early.

During the winter men occasionally got up in the middle of the night to cook a snack, since all were familiar with the kitchen. During the summer they would often be up very late, not realising the time, because of the continuous daylight; usually they cooked a snack before retiring, and this might represent "breakfast" if they chose to sleep late. These examples show that they did not allow meals to interfere unduly with their chosen sleep habits. Kleitman et al. (1937) studied the effect of late snacks, which they found to produce a slight decrease in body movements during sleep, but no effect on the duration of sleep.

If a man woke late he would have difficulty in getting to sleep at the conventional hour that evening, and would stay up working or reading until the early hours. Then he would go to bed, sleeping till next afternoon. This arrangement tended to progress until the subject found that he was now on "night shift" because he had indulged in sleep/wakefulness cycles of duration longer than 24 hours. There were no landmarks of light and darkness to warn him that he had also lost a calendar date.

The opposite might have been expected during sledging, because of the pattern of 8 hours' work and 8 hours' rest—namely, 4 days' activity in 3. In fact, this was not so. Awakening on the trail was usually spontaneous, or by one's sledging companion. Other forces might include hunger, cold, a full bladder, or noise from the dogs. Alarm clocks were used only occasionally.

Other aspects of expedition life have been described elsewhere (Lewis 1954, Taylor 1955, Simpson 1957).

Methods

One of the approaches in the investigation of biological rhythms is to alter artificially the rhythm of the external environment—e.g., to see what happens to men on an 18-hour or a 28-hour day (Lindhard 1910, Kleitman and Kleitman 1953, Lewis and Lobban 1954).

On the British North Greenland Expedition this was impracticable because many of the scientific duties involved radio and meteorological reports at strict G.M.T. Time-signals from the British Broadcasting Corporation were used continually to check chronometers, an essential part of navigation. Because of this constant preoccupation with clock time, the observational approach was used, and though the filling-in of sleep-cards did rely on memory it was recent memory. The men coöperated well.

Seasonal Variations

During the times when the sleep patterns were disrupted, many men were going to sleep when others were getting up (fig. 7). The casual observer would conclude that the men asleep were lazy, but the sleep totals showed that this was not so, and the impression of oversleeping was not confirmed. Even though "demand sleeping" was possible (i.e., whenever a man felt so inclined) the number of hours taken was not excessive and corresponded to the customary 8 hours.

The environmental influences in Greenland affected the duties of the expedition. During the darkness there was comparative inactivity and greater opportunity for sleeping; the summer was the season for outdoor work. It was expected that more sleep would have been taken in the dark inactive period, but the difference was small. Nor was there a significant change in the sleep totals during the periods of activity. Less sleep was taken in the second year, but with little variation between months.

Disrupted Sleep and Naps

In the first year, during the late summer and autumn, all men worked very hard to unload the aircraft and establish the base. Because of near exhaustion each day, there were no sleep problems; but after this activity was over, with the onset of winter, some men started complaining of sleeplessness, and the taking of naps became a feature. It is a common observation that, in ordinary circumstances of living, if after a sleepless night one takes a long nap, one's sleep for the following night tends to be disturbed. In Greenland there was a seasonal change in the number of sleepless nights, higher figures being found in winter and (to a lesser extent) summer. In the other seasons the number of interruptions was very small.

An identical seasonal variation was found in the incidence of naps. From this it might be presumed that they were taken to compensate bouts of interrupted sleep, but there was in fact no relationship. On the monthly basis only one nap was taken for every twenty interruptions of sleep, and there were only rarely direct coincidences of a nap within 48 hours of disturbed sleep. In three members there were no coincidences at all.

Specific Duties

It has been mentioned that the British North Greenland Expedition was a community only partially "organised." Provided the routine chores were done and one's scientific programme was carried out, one's spare time was not disciplined. With such a background it is interesting to observe the effects of specific regular scientific duties on the sleep/wakefulness patterns of the members concerned. For example, every morning at 0600 hr. there was a weather observation, and this had to be transmitted by radio. It was possible to compare the patterns of two meteorologists for 1952 and 1953.

For one (A) in the winter of 1952, the duty caused his sleep to break up into two equal lengths, a pattern unchanged over 4 months. In the following year, in identical circum-

stances, the other (B) showed that as the winter progressed he was taking most of his sleep after the meteorological duty—i.e., he stayed up for this and then took his main sleep (fig. 7).

It was possible also to study the sleep patterns of two radio-operators.

During winter at the Northice, where he was one of three men, one radio-operator took about a third of his sleep before the 0600 hr. duty and the remainder afterwards, including a great number of naps at haphazard times, so that over a month almost every hour in the 24 was, at some time or other, used for sleep. The next year he did the same duty at the main laboratory where over twenty men were working under conditions of greater communal organisation. Despite this change of environment, his sleep pattern was disrupted as in the previous year. If, however, the expedition had exerted social pressure on the members' off-duty times, he would probably have conformed to the community timetable.

His patterns may be compared with those of the other radio-operator, who went to bed at a conventional hour, about midnight, woke just before 0600 hr. to transmit the report, and then promptly went back to sleep for 2 hours before breakfast. After that he was up for the whole day and only rarely took a nap.

These two men, both petty officers trained rigidly in naval discipline, carried out identical duties on the expedition. Whereas one's sleep was disrupted, the other showed no interference at all.

These findings show that the conventional 8 hours may indeed represent a biological need, and is influenced neither by the absence of social pressures nor by the light-darkness patterns. Nor indeed is it influenced by physical work; although there are variations from day to day, the average hours of sleep during the month do not change.

Summary and Conclusions

Members of the British North Greenland Expedition, living in the Arctic as a partially organised community, showed interesting disruption of their sleep/wakefulness patterns.

The time of going to sleep and of getting up varied greatly, especially during midwinter (continuous darkness) and midsummer (continuous light), and without special preference to a particular hour.

During the continuous darkness and continuous light more of the 24 clock hours were used for sleep, though the monthly total variations over the 2 years were slight; there were no great differences between months of outdoor activity and months when the men were confined to the hut. The winter months were characterised by many interruptions of sleep, and by the taking of naps. There was, however, no relationship or coincidence between interrupted sleep and naps.

The effects of specific routine duties on sleep showed how men varied when there was no need to conform to a social pattern. This varied response was seen in men whose backgrounds of Service discipline and training were identical.

Though the men were at liberty to sleep almost as long as they liked, the mean duration of sleep was 7·9 hours. The approximate period of 8 hours taken in temperate climates would indeed appear to represent a normal demand.

We wish to thank Mr. Roger Matchett and Petty Officer D. E. Lee for valuable technical assistance.

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MAINTENANCE THERAPY IN PERNICIOUS ANÆMIA

CONTROLLED BY DETERMINING VITAMIN-B_{12} LEVEL IN PLASMA

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SINCE purified preparations of vitamin B_{12} became available in 1949, combinations of the pure vitamin + "intrinsic factor" have been widely used in the oral treatment of pernicious anæmia. Their adequacy over long periods is, however, somewhat in doubt, and oral versus parenteral treatment of pernicious anæmia has been discussed (Berlin 1953, Mollin and Ross 1953, 1954, Spies et al. 1953, Gerhartz and Koelle 1954 Heinrich 1954, Lowther et al. 1954, Baker and Mollin 1955, Blackburn et al. 1955, Begemann 1957, Ungley 1957).

Since low levels of vitamin B_{12} in the serum or in the plasma may precede clinical signs of vitamin-B_{12} deficiency in pernicious anæmia (Mollin and Ross 1954, Østergaard Kristensen and Søeborg Ohlsen 1956), determination of the vitamin-B_{12} level in the plasma is likely to afford not only a specific but also the earliest method of disclosing whether pernicious-anæmia therapy is insufficient. To elucidate this problem we followed the vitamin-B_{12} levels in the plasma and the hæmatological values in twelve patients. According to the ordinary principles of maintenance therapy prevailing in the department, they were treated by the oral preparation 'Cycoplex MCO,' which consists of vitamin B_{12} plus small quantities of hog pyloric mucosa (see below).

Material

The material comprises twelve patients from the Frederiksberg Hospital, medical department E: ten women age 45–84 and two men aged 65 and 75. All presented typical pernicious anæmia: megaloblastic bone-marrow, abnormally low vitamin-B_{12} levels in the plasma, histamine-refractory achlorhydria, anæmia, and normal absorption of fat.

Before treatment the vitamin-B_{12} levels in the plasma averaged 57 μμg. per ml. (range 10–120 μμg. per ml.), the lower limit of normal being 150 μμg. per ml. (see below). The hæmoglobin (Hb) level averaged 49% (range 34–77%), the red cells 1,740,000 per c.mm. (range 1,130,000–2,890,000 per c.mm.).

Methods

The vitamin-B_{12} levels in the plasma were determined (by H. P. Ø. K.) by the method using *Lactobacillus leichmanni* 313 (Østergaard Kristensen 1956). Normal values for adults are on an average 392 μμg. per ml. (range 150–950).

Sternal bone-marrow was examined (by A. S. O.) partly in sections after coagulation and mounting and partly in smears stained by the method of May-Grünwald-Giemsa.

Other hæmatological studies—Hb level (100% = 14·8 g. per 100 ml.), red-cell counts, colour-index $\left(\frac{\text{Hb \%}}{\text{erythrocytes (mill.)} \times 21}\right)$, total and differential white-

cell counts, and serum-iron determinations (by the method of Høyer 1950)—were made by the Central Laboratory of the Frederiksberg Hospital.

The patients were admitted while the treatment was being instituted and then discharged for frequent outpatient control. The control period was 7–25 months on maintenance therapy. In most cases the vitamin-B_{12} levels in the plasma were determined at intervals of 1 or 2 months.

Initial Treatment

At the outset ten of the twelve patients had intramuscular injections of vitamin B_{12}, usually 30–60 μg. daily for the first 10 days. In a few cases this treatment was then supplemented by weekly injections of 60 or 90 μg., in one up to 300 μg., of vitamin B_{12}. The total dose of vitamin B_{12} administered parenterally ranged from 300 to 1080 μg. and was given over a period of from 10 to 51 days. In case 11 the treatment was instituted with ' Hepsol fortior MCO ' (see below) 5 ml. four times in the course of 20 days, and in case 1 cycoplex was given from the outset. A possible deficiency of other hæmatopoietic substances, primarily iron and ascorbic acid, was met by adequate measures (cf. Pedersen et al. 1957).

All the patients gave a satisfactory initial response—i.e., a typical reticulocyte reaction and a satisfactory increase in erythrocyte-count.

Maintenance Therapy

After this initial therapy nine of the ten patients who had had injections of vitamin B_{12} were started on treatment with cycoplex MCO. The group with cycoplex as maintenance therapy thus comprised ten patients (cases 1, 2, 3, 4, 4a, 5, 7, 8, 9, and 10).

Case 12a, who initially had injections of vitamin B_{12}, was shifted to injections of hepsol fortior MCO, and in case 11 the treatment with hepsol fortior was just continued.

Preparation and Dosage

Cycoplex MCO.—Each capsule contains 5 μg. of crystalline vitamin B_{12} + intrinsic factor corresponding to 50 mg. of dried hog pyloric mucosa suspended in oil. The daily maintenance dose was two to four capsules daily; it was increased later in two cases to eight capsules daily.

Hepsol fortior MCO.—This contains liver extract corresponding to 10 "clinical units" plus 20 μg. of crystalline vitamin B_{12} per ml. The maintenance dose for the two patients who served as "controls" of those treated with cycoplex was 5 ml. of intramuscular hepsol fortior every 2 or 3 weeks.

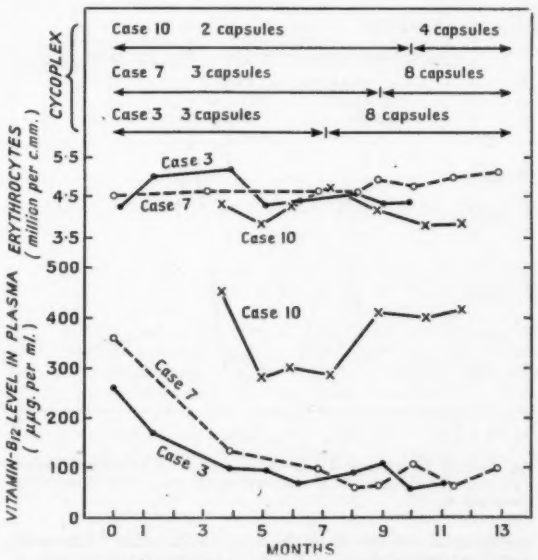

Fig. 2—Vitamin-B_{12} levels in plasma and erythrocyte-counts in 3 patients with pernicious anæmia on treatment with cycoplex MCO. After cases 3 and 7 had been treated for 7 and 9 months respectively, daily dose was increased from 3 to 8 capsules.

Results

Vitamin-B_{12} Levels in Plasma during Oral Maintenance Therapy with Cycoplex

Fig. 1 shows the vitamin-B_{12} levels in the plasma during treatment with cycoplex. Case 1 (lowest curve on the left) did not have injections but was started at once on cycoplex. After a year's treatment his vitamin-B_{12} level in the plasma was only 125 μμg. per ml.

In eight of the nine patients whose treatment began with injections of vitamin B_{12} the vitamin-B_{12} levels in the plasma had been raised to normal when cycoplex was started. In case 5 the vitamin-B_{12} level at that time was only 140 μμg. per ml., but the first determination after cycoplex was started showed a value above 200 μμg. per ml. in this case too.

After 99–154 days—i.e., after 3–5 months' maintenance therapy with cycoplex—the vitamin-B_{12} levels in the plasma had fallen, however, to abnormally low values—less than 150 μμg. per ml. in six of the nine patients. In six of them, who remained under control, this level remained unchanged or declined further.

Cases 8 and 9 showed for some time subnormal levels which, however, after 14–15 months, fell below 150—140 and 130 μμg. per ml. respectively.

Only case 10 had an entirely normal level of vitamin B_{12} in the plasma after more than 2 years on cycoplex. Her initial level had been 50 μμg. per ml.—i.e., decidedly in the range of pernicious anæmia, as in the other patients.

Dependence of Vitamin-B_{12} Level on Intensity of Initial Treatment

It might be presumed that the more intensive the initial treatment the longer is the period, during

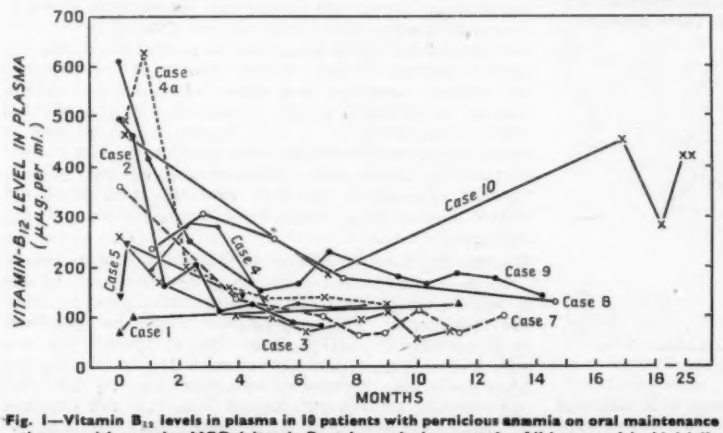

Fig. 1—Vitamin B_{12} levels in plasma in 10 patients with pernicious anæmia on oral maintenance therapy with cycoplex MCO (vitamin B_{12} + hog pyloric mucosa). All but case 1 had initially received injections of crystalline vitamin B_{12} amounting to a total of 300—1080 μg., which had raised the vitamin-B_{12} levels in plasma to normal.

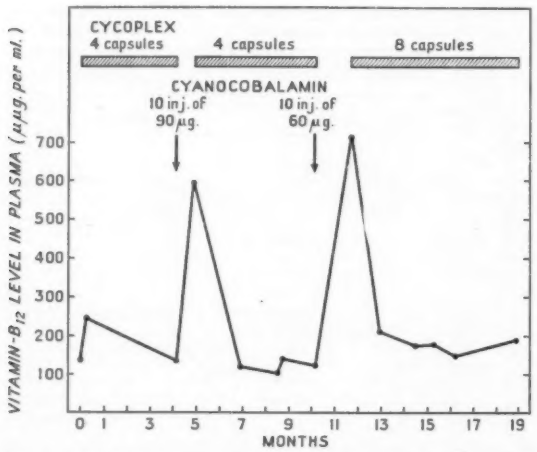

Fig. 3—Case 5: vitamin-B_{12} levels in plasma in pernicious anæmia treated with cycoplex MCO and intermittent injections of crystalline vitamin B_{12}.

insufficient maintenance therapy, before the vitamin-B_{12} level in the plasma falls to abnormally low values. This question cannot be answered by the present study, but cases 4 and 4a, who had the most intensive initial treatment (1050 and 1080 μg. of vitamin B_{12} respectively), showed levels lower than 150 μμg. at the end of 5 months, whereas the patient who exhibited a normal level at the end of 2 years (case 10) had only received 540 μg. of vitamin B_{12} initially.

Dependence of Vitamin-B_{12} Level on Dose of Cycoplex

Case 10, whose vitamin-B_{12} level remained normal throughout 2 years on cycoplex, received two capsules daily during the first 10 months, and after that four capsules daily. The two other patients (cases 8 and 9) whose vitamin-B_{12} levels also remained higher for some time than in the other patients, also had four capsules daily. Their maintenance dose did not, however, differ from that in some of the patients whose vitamin-B_{12} levels soon fell to a low value.

In two patients (cases 3 and 7) whose vitamin-B_{12} levels in the plasma were always low the dose of cycoplex was increased from three to eight capsules daily. Fig. 2 shows that, even after 4 months on this increased dose, the level of vitamin B_{12} in the plasma remained abnormally low—70 and 100 μμg. per ml. respectively. The increase in the dosage did not raise the vitamin-B_{12} level.

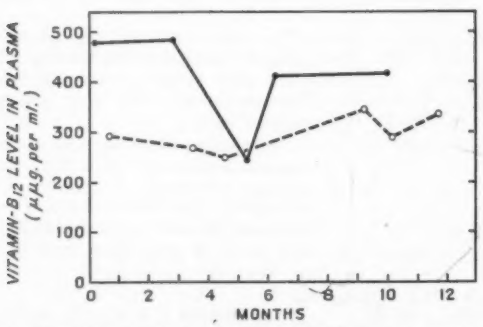

Fig. 4—Vitamin-B_{12} levels in plasma in 2 patients with pernicious anæmia on parenteral maintenance therapy with intramuscular injections of liver extract (hepsol fortior MCO) 5 ml. about every 2 weeks. Vitamin-B_{12} levels were determined at least one week, and usually two weeks, after injections.

Fig. 3 illustrates the findings in case 3. Owing to a low vitamin-B_{12} level in the plasma and the occurrence of paræsthesiæ during cycoplex therapy, this patient had injections of crystalline vitamin B_{12} in two periods; this led to a prompt rise in the vitamin-B_{12} level to normal and improvement of the paræsthesiæ.

Vitamin-B_{12} Level in Plasma during Maintenance Therapy with Injections of Hepsol Fortior

Fig. 4 shows the vitamin-B_{12} levels in the plasma of the two patients (cases 11 and 12a) treated with injections of hepsol fortior. At the end of 9–10 months both had vitamin-B_{12} levels within the normal range. The estimations were made at least 1 week, and usually 2 weeks, after the last injection of hepsol.

Vitamin-B_{12} Level in Relation to Hæmatological Findings during Oral Maintenance Therapy

Table I gives these hæmatological findings in nine patients on cycoplex when the vitamin-B_{12} level in the plasma was first found to be less than 150 μμg. per ml. These patients had initially received injections of vitamin B_{12}.

In six of these nine patients the vitamin-B_{12} levels in the plasma continued to be estimated after the levels had fallen to less than 150 μμg. per ml. Table II compares the hæmatological values at the time shown in table I with those found after the vitamin-B_{12} levels had remained low for a long time in these six cases.

The tables show (1) that a vitamin-B_{12} level of less than 150 μμg. per ml. was found in the plasma when the Hb was entirely normal and the number of red cells satisfactory (averaging about 4,500,000 per c.mm. and being less than 4,000,000 per c.mm in only one case); (2) that a low vitamin-B_{12} level in the plasma for an average of $5^1/_2$ months did not involve a decrease of either Hb or red cells. One patient with a low vitamin-B_{12} level in the plasma was followed up for nine months without any signs of recurrence of the anæmia.

TABLE I—VITAMIN B_{12} LEVEL IN PLASMA, HB, RED CELLS, AND COLOUR-INDEX DURING MAINTENANCE THERAPY WITH CYCOPLEX WHEN VITAMIN-B_{12} LEVEL WAS FIRST FOUND TO BE LESS THAN 150 μμG. PER ML.

Average of 9 patients

Vitamin-B_{12} level in plasma (μμg per ml.)	Hb (%)	Red cells (million per c.mm.)	Colour-index
126 (range 110–145)	91 (range 80–104)	4·29 (range 3·57–5·18)	1·01 (range 0·93–1·17)

Fig. 2 shows the vitamin-B_{12} levels in the plasma and the number of red cells for three of the patients (cases 3, 7, and 10) on cycoplex. In case 7 the number of red cells was normal despite an abnormally low level of vitamin B_{12} in the plasma. In case 10 the number of red cells was on several occasions less than 4,000,000 per c.mm. despite a normal level of vitamin B_{12} in the plasma. This combination of a low vitamin-B_{12} level and a normal number of red cells in one patient and of a normal vitamin-B_{12} level with a low number of red cells in another emphasises the fact that the number of red cells is not an ideal indicator of a possible vitamin-B_{12} deficiency.

Vitamin-B_{12} Level in Plasma in relation to Erythropoiesis

In seven of the ten patients on cycoplex and in one of those on hepsol sternal puncture was repeated during the treatment. The bone-marrow could be described as completely normal in only two of them: the one who had a normal level of vitamin B_{12} in the plasma after more than 2 years on cycoplex (case 10), and the one who was treated with hepsol (case 12a) and also had a normal level of vitamin B_{12} in the plasma.

Of the remaining six patients on cycoplex in whom sternal puncture was repeated (cases 2, 3, 4, 4a, 5, and 7)

TABLE II—VITAMIN-B_{12} LEVELS IN PLASMA, HB, RED CELLS, AND COLOUR-INDEX DURING MAINTENANCE THERAPY WITH CYCOPLEX: *a*, WHEN VITAMIN-B_{12} LEVEL OF LESS THAN 150 μμG. PER ML. WAS FIRST FOUND; *b*, AFTER AN AVERAGE OF 162 (RANGE 97–270) DAYS WITH VITAMIN-B_{12} LEVELS OF LESS THAN 150 μμG. PER ML.

Average of 6 patients

Vitamin-B_{12} level in plasma (μμg. per ml.)		Hb(%)		Red cells (mill. per c.mm.)		Colour-index	
a	*b*	*a*	*b*	*a*	*b*	*a*	*b*
120 (range 110–145)	95 (range 55–120)	94 (range 89–104)	94 (range 85–105)	4·56 (range 4·13–5·18)	4·53 (range 4·17–5·14)	0·98 (range 0·93–1·02)	0·97 (range 0·91–1·06)

four (cases 2, 3, 5, and 7) showed a few typical (Ehrlich) megaloblasts despite a normal amount of Hb and a normal erythrocyte-count 3–6 months after an abnormally low level of vitamin B_{12} had first been found. The two others (cases 4 and 4a) had no characteristic megaloblasts, but one of them had "macrometamyelocytes."

Neurological Signs

Before the treatment four patients (cases 4, 4a, 10, and 11) had shown slight signs of myelopathy, which disappeared or subsided perceptibly during the initial treatment.

In case 4, who had lost the Achilles-tendon reflexes before treatment, these reflexes became normal when the vitamin-B_{12} level in the plasma had been abnormally low for several months. Two patients (cases 1 and 5) with no pre-treatment signs of myelopathy, complained during cycoplex therapy of paræsthesiæ. At that juncture the peripheral blood was normal, whereas the vitamin-B_{12} level in the plasma was low. After injections of vitamin B_{12} the paræsthesiæ disappeared in case 1 and improved in case 5.

Discussion

At our present stage of knowledge, and with our present diagnostic methods, the maintenance therapy of pernicious anæmia must keep normal the amount of Hb, the number of red cells, the bone-marrow, and the vitamin-B_{12} level in the plasma. Our results show that the oral administration of cycoplex MCO, which consists of vitamin B_{12} and small quantities of hog pyloric mucosa, did not keep the bone-marrow and the vitamin-B_{12} level normal: in nine of ten patients the vitamin-B_{12} level in the plasma was abnormally low; in four of seven patients the bone-marrow was "partially megaloblastic"; and in a fifth case "pernicious-anæmia neutrophils" were found. This maintenance therapy is therefore insufficient, although the amount of Hb and the erythrocyte-counts were normal.

The doses of vitamin B_{12} injected initially were probably not sufficient to restore tissue reserves in our patients (see below), but even in the two patients who received more than 1000 μg. of vitamin B_{12} initially the vitamin-B_{12} level in the plasma fell to below normal within 5 months on cycoplex.

Our investigations confirmed that patients on maintenance therapy for pernicious anæmia can have a low vitamin-B_{12} level in the plasma for months without showing clinical signs of vitamin-B_{12} deficiency. Determinations of the vitamin-B_{12} level in either the plasma or the serum are therefore necessary for assessing the efficacy of maintenance therapy.

Since the various combined preparations for oral treatment of pernicious anæmia differ in composition and in degree of purification of the intrinsic factor, the experience with one preparation (cycoplex MCO) does not permit conclusions regarding the efficacy of others. Whether any of the commercial preparations for oral use can maintain normal vitamin-B_{12} levels in the plasma in long-term therapy is a question which calls for further study. The failure of a threefold dose of our preparation to raise the vitamin-B_{12} level suggests that simple underdosage of intrinsic factor is not the whole explanation.

In discussing oral versus parenteral treatment of pernicious anæmia it is important to realise, as Mollin and Ross (1953) and Ungley (1957) point out, that the quantities of vitamin B_{12} required to afford "satisfactory" increases in reticulocyte and erythrocyte counts in anæmic patients constitute only a very small fraction of the quantities required to restore normal tissue reserves of vitamin B_{12}. Since in untreated pernicious anæmia the deficit in liver-tissue reserves presumably amounts to about 1500 μg. of vitamin B_{12} (cf. Ross and Mollin 1957, Swendseid et al. 1957), and since studies of vitamin B_{12} labelled with radioactive cobalt (Glass et al. 1954, Baker and Mollin 1955, Callender and Evans 1955) have proved that the amount of vitamin B_{12} which can be absorbed from the intestinal tract is very limited (1–2 μg. after the administration of 50 μg. of vitamin B_{12} + intrinsic factor), the depleted reserves can certainly not be replaced within a short time by the usual oral treatment.

In patients with a low level of vitamin B_{12} in the plasma, indicating small or depleted tissue reserves, the risk of hæmatological relapse or of the development of neurological deficiency signs must be high. This applies particularly under conditions in which either the requirement is increased (infection, hæmorrhage, &c.) or the absorption is decreased. In treating pernicious anæmia, therefore, one must try not only to increase the Hb and the red cells to normal but also to replace the depleted tissue reserves.

The initial treatment should therefore be by the parenteral route. In view of the considerable vitamin-B_{12} deficiency in the tissue reserves of these patients this initial treatment must also be much more intense than that in current use. Most patients will probably require about twenty injections of 100 μg. of vitamin B_{12}, if normal tissue reserves are to be restored.

Maintenance therapy.—If oral therapy is chosen, it seems absolutely necessary to control the state by determinations of the vitamin-B_{12} level in the plasma and by the appearance of the bone-marrow. In the absence of facilities for determining the vitamin-B_{12} level in the plasma it seems wise at present to use parenteral treatment also for maintenance purposes. The cheapest form is injections of vitamin B_{12}—e.g., 100 μg. every two weeks. Using this procedure the physician knows that he can maintain not only normal erythrocyte-counts but also normal vitamin-B_{12} levels in the blood.

Summary

Ten patients with pernicious anæmia were treated initially with injections of vitamin B_{12} (cyanocobalamin), which brought the vitamin-B_{12} level in the plasma up to a normal value. Nine of these patients were given oral maintenance therapy with 'Cycoplex MCO,' which consists of vitamin B_{12} and small quantities of dried hog pyloric mucosa. During this treatment the levels of vitamin B_{12} in the plasma fell to abnormally low values in eight of the nine patients, and in one patient,

who also had received cycoplex as initial therapy, the level remained low. At the same time the bone-marrow showed signs of insufficient therapy, whereas the amount of Hb and the erythrocyte-count mostly remained normal.

It proved impossible to restore the vitamin B_{12} in the plasma to a normal value by increasing the dose of cycoplex, but the injection of vitamin B_{12} immediately did so.

In two patients treated with intermittent injections of a preparation of liver extract supplemented with crystalline vitamin B_{12} ('Hepsol fortior MCO') the level of vitamin B_{12} remained normal.

The control of maintenance therapy of pernicious anæmia should include, in addition to determination of Hb and erythrocyte-count, determination of the vitamin-B_{12} level in the plasma and examination of the bone-marrow. Only in this way can insufficiency of the therapy be disclosed at an early stage.

As initial treatment of pernicious anæmia, injections of vitamin B_{12} are recommended, and this initial treatment should be more intensive than usual, the total dose being about 2000 μg. of vitamin B_{12}.

The oral preparation cycoplex MCO, which consists of vitamin B_{12} and small quantities of hog pyloric mucosa, appears to be insufficient, because it does not keep the bone-marrow and the vitamin-B_{12} level in the plasma normal.

The efficacy of other oral preparations should be studied by determining the vitamin-B_{12} level in the plasma and by examining the bone-marrow.

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"... The present generation of consultants have never been general practitioners. They have planned their own careers and applied their own labels. Further, most of them have found that the way to success has been through increasing limitation. They are one-tool technicians or one-disease diagnosticians. On the whole they have had a simpler training and they lead an easier life than the general practitioners, and they often have less ability and certainly less wisdom. The practitioner needs a consultant for advice about a particular problem in a particular patient. He chooses the consultant either for his well-known familiarity with that particular problem, or for his probable ability to handle, and to impress, that particular patient. . . . The choice of a consultant is one of the most important decisions of general practice. There is, unfortunately, a tendency today for patients to choose their own consultants, usually on the advice of an acquaintance at a cocktail party, the doorkeeper at the hotel, or the gossip writer in an evening paper."—Sir HENEAGE OGILVIE in *Medical Ethics*, edited by Dr. Maurice Davidson. London, 1957; p. 65.

SERUM-LIPIDS AND ATHEROSCLEROSIS AMONG YEMENITE IMMIGRANTS IN ISRAEL

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Israel's population is composed of immigrants from East and West differing widely in their cultural background and ways of life. Each group is reluctant to change its habits of eating, so that in Israel there is a unique opportunity for a long-term experiment on the influence of diet upon serum-cholesterol levels and the incidence of atherosclerosis.

Apart from the higher atherosclerosis mortality-rate in Israel among immigrants from Western countries (Dreyfuss 1953, Toor et al. 1954), a striking difference has been found between Yemenites who had immigrated over twenty years ago ("early" Yemenite immigrants) and those who had immigrated within the previous five years ("recent" Yemenite immigrants). After assembling statistical data on atherosclerosis mortality-rates among different communities in Israel during the years 1953–55, we studied 528 recent and early Yemenites to determine their social conditions, diet, nutritional status, and serum levels of cholesterol, phospholipids, and total lipids. We then tried to correlate the findings with the atherosclerosis mortality-rate.

All the Yemenites were examined by one of us (J. A.) with the help of their local physician. Those with a history of cardiovascular disease or other abnormality liable to affect the serum-cholesterol level were excluded from the inquiry, and so were those with a blood-pressure higher than 140/90 mm. Hg, those who were very underweight, those with enlarged spleen or liver, and those with low blood-cholesterol levels in the presence of impaired liver-function tests. Pregnant and lactating women were also excluded. The sex and age distribution of the 274 recent and 254 early Yemenites selected are shown in table I.

TABLE I—AGE AND SEX DISTRIBUTION OF RECENT AND EARLY YEMENITES

Age (years)	Recent Yemenites		Early Yemenites	
	Male	Female	Male	Female
35–44	52	42	43	47
45–54	57	43	48	54
54–64	56	24	37	25
Total	165	109	128	126

Social Conditions

Data about social status were collected with the help of the local physician and social worker and are set out

TABLE II—OCCUPATIONS OF RECENT AND EARLY YEMENITES

Age and sex		Yemenite immigrants	No. of cases	Farm workers (%)	Industrial workers (%)	White-collar workers small artisans, pedlars (%)	Housewives (%)	Dependent on social relief (%)	Other dependants (%)
Males	35–44	Recent	52	80·8	9·6	5·8	..	3·8	..
	45–54		57	45·6	3·5	12·3	..	38·6	..
	55–64		56	21·4	5·4	8·9	..	64·3	..
	35–44	Early	43	62·7	30·3	7·0	..	..	..
	45–54		48	62·5	20·9	10·4	..	..	6·2
	55–64		37	54·1	16·2	10·8	..	..	18·9
Females	35–44	Recent	42	26·2	..	..	73·8	..	..
	45–54		43	18·6	..	..	81·4	..	..
	55–64		24	8·3	..	..	41·7	50·0	..
	35–44	Early	47	31·9	4·3	..	63·8	..	..
	45–54		54	24·1	..	..	75·9	..	..
	55–64		25	..	..	..	76·0	..	24·0

in table II. The recent immigrants were living in transit camps under poor conditions, whereas most of the early immigrants lived in their own houses under better economic circumstances. The number of children was highest and monthly income lowest among recent Yemenites. Among the recent immigrants the mean number of persons per family was 6·5, compared with 5·0 in the early Yemenites (Yemenite children leave their families to fend for themselves at an early age and only children dependent on the support of their families are included in these figures). The mean monthly income per person in the recent Yemenites was I.L. 19 (I.L. 1·80 = $1), compared with 38 I.L. in the early immigrants.

Dietary Survey

The survey was conducted during the clinical and laboratory investigation and includes additional data, collected by the social worker, on the nutritional habits and consumption and composition of food of 55 recent and 21 early Yemenite families. The figures in table III represent average daily values.

The diet of recent Yemenites contains a lot of *pita*, a type of flat yeastless bread. They also eat large quantities of vegetables, very little meat (once weekly), and very little fat (table III), which is mainly in the form of *samne** (boiled butter with *hilbe*, the seed of fenugreek (*Trigonella fœnumgræcum* L.)). As the quantity of ingested fat is very small, the nature, composition (Bronte-Stewart et al. 1956), and/or preparation (Sinclair 1956) of this fat probably has little influence on the pathogenesis of atherosclerosis.† Both early and recent Yemenites make abundant use of sunflower seeds, chick-pea seeds, nuts, and almonds.

Though the data collected on recent and early Yemenites express long-term nutritional habits, they cannot be as accurate, of course, as those provided by a controlled nutritional experiment. Our results are, however, closely similar to those obtained by Strauss et al. (1954) (table III).

Among males, 94% of recent and 92% of early Yemenites consumed more than a litre of alcohol monthly. There was no striking difference in tobacco consumption between the two groups.

* *Samne* is prepared by boiling ordinary butter, which contains about 82% fats, with small amounts of *hilbe* for its flavour. The water thus extracted is discarded, so that the new product contains about 95–98% fats. As the cooking of the butter is not performed under pressure, it is doubtful if all fatty acids undergo complete oxidation.

Clinical and Laboratory Findings

Height and Weight

There was no significant difference in the average height of the two groups, but the weight of the recent Yemenite immigrants was significantly lower. The weight/height ratio ‡ (table IV) was thus lowest in recent Yemenites. In the 35–44 age-group the weight/height ratio was normal among early Yemenites and fell with increasing age. In recent Yemenite women the ratio was rather higher than in men of the same age and did not drop with increasing age.

TABLE III—DAILY DIET OF YEMENITES

Group	Total calories per day	Animal proteins (g.)	Fats (g.)	% calories derived from fats
Recent Yemenites ..	1750	12	30	16
Early Yemenites ..	2350	20	55	21
Yemenites (overall) (Strauss et al. 1954)	2296	19	51	20

Blood-pressure

Recent Yemenites had the lowest systolic and diastolic pressures. The mean diastolic values of the early Yemen-

† During the period of rationing, when the government supplied fats and animal proteins cheaply and equally to the whole population, the recent Yemenite immigrants were accustomed to selling their rations and restricted themselves essentially to food rich in carbohydrates.

‡ $\frac{\text{Weight in kg.}}{\text{Height in cm.}-100} \times 100$.

TABLE IV—MEAN AND STANDARD DEVIATIONS OF TOTAL CHOLESTEROL, PHOSPHOLIPIDS, CHOLESTEROL/PHOSPHOLIPID RATIO, TOTAL LIPIDS, AND WEIGHT/HEIGHT RATIO IN RECENT AND EARLY YEMENITES

Age and sex		Yemenite immigrants No.	Yemenite immigrants Arrival	(1) Total cholesterol (mg. per 100 ml.)	(2) Phospholipids (mg. per 100 ml.)	Ratio (1)/(2)	Total lipids (mg. per 100 ml.)	Weight/height ratio
Male	35–44	52	Recent	**146** ±28	207 ±23	**0·72** ±0·15	**556** ±67	94 ±9
		43	Early	**189** ±29	217 ±39	**0·88** ±0·10	**634** ±111	99 ±10
	45–54	57	Recent	**158** ±32	212 ±52	**0·76** ±0·14	*607* ±105	92 ±8
		48	Early	**193** ±37	233 ±40	**0·85** ±0·13	*674* ±104	96 ±12
	55–64	56	Recent	**158** ±29	*205* ±48	**0·79** ±0·12	*594* ±93	87 ±10
		37	Early	**206** ±40	*233* ±50	**0·89** ±0·13	*655* ±101	92 ±9
Female	35–44	42	Recent	**172** ±26	237 ±47	*0·75* ±0·12	*618* ±72	**94** ±8
		47	Early	**194** ±30	228 ±37	*0·84* ±0·11	*664* ±93	**104** ±14
	45–54	43	Recent	**172** ±29	*219* ±39	*0·80* ±0·12	**615** ±89	**95** ±10
		54	Early	**209** ±28	*245* ±37	*0·87* ±0·11	**694** ±97	**108** ±18
	55–64	24	Recent	**190** ±26	233 ±37	0·83 ±0·11	**633** ±65	*95* ±11
		25	Early	**228** ±36	253 ±31	0·90 ±0·11	**722** ±97	*107* ±17

Figures in bold type show highly significant differences (critical ratio > 3·5).
Those in italics show significant differences (critical ratio > 2·5).

ite immigrants were significantly higher. As those with high blood-pressure were not included in this study, no definite conclusions on "coronariness" (Gofman et al. 1954) could be drawn from these figures.

Blood

Blood samples were collected in the morning from fasting subjects and separated three to four hours later. Every blood examination was performed in duplicate, and results diverging by more than 5% were discarded. Our method was described in an earlier communication (Toor et al. 1954).

Hæmoglobin.—The mean hæmoglobin values (determined with Sahli's apparatus) were slightly lower in both groups than the accepted values in Western countries (Berry et al. 1952). In females these values were lower than in men for all groups. In men the hæmoglobin values dropped with increasing age, but not so in women. The hæmoglobin values of early Yemenite immigrants were significantly higher than in recent Yemenite groups. The gap between the two decreased with increasing age. There was no significant difference in hæmoglobin values of early and recent female Yemenite immigrants.

Cholesterol.—The mean and median serum-cholesterol value was lowest for recent Yemenites in both sexes and in all age-groups (table IV, fig. 1), and the difference was statistically significant (males, $t = 7{\cdot}35–5{\cdot}15–6{\cdot}30$; females, $t = 3{\cdot}71–6{\cdot}35–4{\cdot}21$).

Phospholipids.—The values were higher among females in all age-groups.

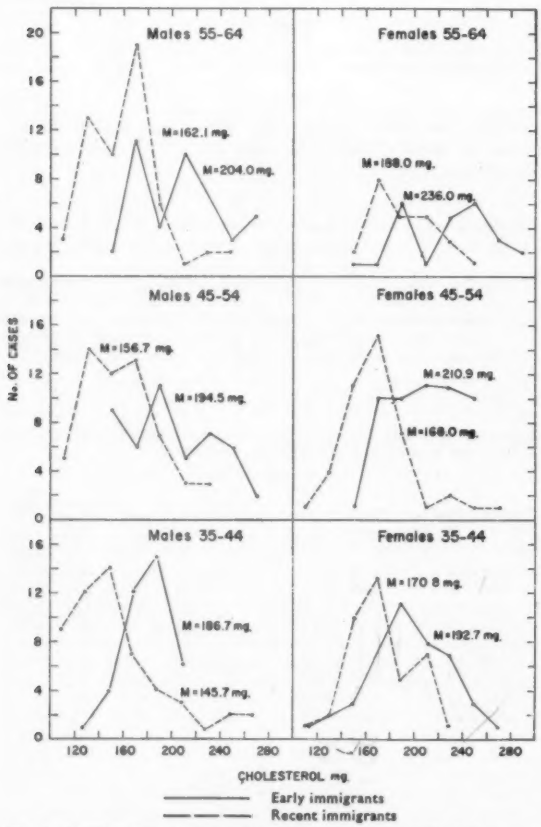

Fig. 1—Distribution of serum-cholesterol values in early and recent Yemenite immigrants in Israel. M = median value.

TABLE V—ATHEROSCLEROSIS MORTALITY OF EARLY AND RECENT YEMENITES (1953–55) (RATES PER 1000 INHABITANTS PER YEAR)

Age and sex		General population		Yemenite immigrants			
				Early		Recent	
		No. of deaths	Mortality-rate	No. of deaths	Mortality-rate	No. of deaths	Mortality-rate
Males	35–44	47	0·44	..	..	..	..
	45–54	203	2·26	6	3·3	2	0·49
	55–64	393	8·56				
	65 +	945	32·2	15	23·6	8	6·3
Females	35–44	20	0·19	1	1·8	..	..
	45–54	82	1·04	3	1·8	2	0·51
	55–64	262	5·9				
	65 +	932	26·5	12	20·0	6	4·7

Cholesterol/phospholipid ratio.—This ratio remained within normal limits, but was lowest among recent Yemenites.

Total lipids.—The mean values were lowest among recent Yemenites, and the differences were significant in both sexes.

The mean of the results for each age-group and the standard deviation are set out in table IV.

Mortality from Atherosclerosis

To minimise the errors due to detailed clinical diagnosis, we have used the group diagnosis of "atherosclerosis" in which we did not include deaths due to hypertension or heart-failure induced by causes other than atherosclerosis. Most of the death certificates from which mortality figures were derived were based on clinical rather than on post-mortem examination. But our main object was a *comparative* study of atherosclerosis mortality-rates in the different communities in Israel. As most of the Jewish population in Israel get their medical treatment through the Sick Fund of the General Federation of Labour, the proportion of errors due to death certificates based on clinical diagnosis is likely to be the same in all sections of the community.

The atherosclerosis mortality-rate in 1953–55 was about four times higher among early Yemenite immigrants than among recent ones (table V). In fig. 2 the rates are compared with those for European Jews (Toor, Katchalsky, Agmon, and Allalouf). It should be stressed that the body build of Yemenites, both early and recent, remained the same. Both groups obeyed religious laws and conformed to social customs to the same extent. Their ways of life were practically unchanged, and no mental stress could be incriminated in the early Yemenites. The mortality-rate from infectious diseases was similar in both groups. The mortality-rate from malignant tumours was lowest among the recent immigrants. The mortality-rate from all causes in recent Yemenites over 65 was practically the same as the over-65 rate among other national groups in Israel. The lower mortality-rate from atherosclerosis among recent Yemenites cannot therefore be ascribed to death from other causes at a younger age.

Discussion

Keys et al. (1950, 1954) established a relation between the amount of fat in the diet, the serum-cholesterol level, and the frequency of atherosclerosis. Katz (1953) pointed out that the differences in the incidence and severity of atherosclerosis "tend to correlate with culturally-conditioned variations in nutrition and diet rather than with racial, climatic or other factors." Most of the Yemenites we studied were manual workers or clerks of limited income, and the recent immigrants were the poorest. Their nutritional status was lower

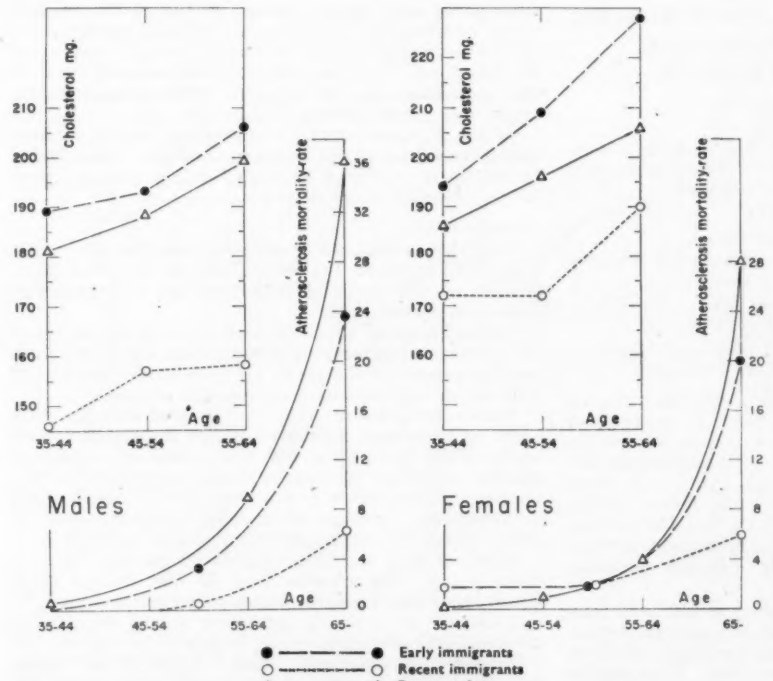

Fig. 2—Atherosclerosis mortality and mean serum-cholesterol values in early and recent Yemenite immigrants in Israel.

than that of the early immigrants; and their serum-cholesterol, phospholipid, and total-lipid values were also lower and were in accordance with the values reported in Guatemalan farm-workers (Mann et al. 1955) and in South African Bantus (Bronte-Stewart et al. 1955).

The lower mortality from atherosclerosis among Yemenites in Israel has attracted much interest during the past few years. In a series of 967 post-mortem examinations, including 123 Yemenites, Shalom (1954) found a third coronary artery in 0·83% of European Jewish immigrants as against 2·44% in Yemenite immigrants—a possible explanation for the lower incidence of myocardial infarction in Yemenite Jews. But this explanation is unlikely because of the increased atherosclerosis mortality among the early Yemenite immigrants.

Our own observations indicate that varicose veins and thrombophlebitis are uncommon among Yemenite immigrant women, even in those who have had many pregnancies. Berman-Yeshurun (1956) found that the incidence of atherosclerosis and thrombophlebitis was low among Eastern Jewish immigrants. These findings raise the possibility that these people are less liable than others to intravascular clotting. The rarity of thromboembolic phenomena among the Bantus (Keys 1956) and the Dutch East Indians (Van Unnik and Straub 1953), however, and the decrease of thromboembolism in Norway during the late war (Strøm 1954), suggest a relation between low-fat diet, thrombosis, and atherosclerosis.

It is also difficult to explain the low serum-cholesterol values on the basis of a metabolic genetic factor in recent Yemenite arrivals, because, with increased consumption of food, particularly fats, cholesterol values and atherosclerosis mortality-rates approach those of Europeans. The possible effect of sunflower-seed oil on serum-cholesterol levels does not seem to be relevant, since both groups eat sunflower seeds.

The cholesterol levels in both early and recent Yemenite women aged 45–64 were significantly higher than in men of the same age. We can suggest no satisfactory explanation for this interesting finding and we are investigating it further.

The differences in the incidence of atherosclerosis among early and recent Yemenite Jewish immigrants can best be explained by the differences in total food intake determined by differences in income. Furthermore, the recent Yemenite immigrants work harder, and remain in a state of caloric imbalance at the age when atherosclerosis is commonest.

Summary

The nutritional status, serum-cholesterol values, and incidence of atherosclerosis were investigated in recent (within past five years) and early (over twenty years ago) Yemenite immigrants in Israel. Serum-cholesterol and total lipid levels were significantly less in recent immigrants. On the other hand, the atherosclerosis mortality-rate was four times higher, for the same age and sex, in the early Yemenite immigrants and approached the rate for European Jews. Among the early immigrants, the average income per head was double that on which the later arrivals were living.

This study, undertaken as a part of the research programme on morbidity and mortality from atherosclerosis among the various communities in Israel, has been made possible by a grant from the Kupath Holim, Workers' Sick Fund of Israel. We wish to thank Dr. G. Kalner, chief of the statistical department, Israel Ministry of Health, for providing the data on mortality-rates of different age-groups; and we gratefully acknowledge the aid of Mrs. S. Seligson, head of the medical statistical department of the Sick Fund, for the statistical analyses.

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VENTRICULO-SUBDURAL DRAINAGE IN INFANTILE HYDROCEPHALUS

ANALYSIS OF EARLY RESULTS

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MANY operations may relieve hydrocephalus, but none is suitable for all types of the disease. In an attempt to fill this gap, the present procedure was devised by one of us (D. M. F.) as a drainage from a lateral ventricle to the supratentorial subarachnoid space. A brief announcement in these terms was made (Forrest 1955), but it became obvious soon afterwards that the method was in fact a ventriculo-subdural drainage—a method which has been used before with different materials (Taylor 1909).

Thus founded in error, the operation would have been abandoned had we not observed that in a high proportion of the early cases the disease was becoming arrested. This led us to persist with a longer trial. The patients operated on in this series have now been followed up for between twenty and thirty-two months, and the effect of the operation can be seen in reasonable perspective.

Material

To give the method a comprehensive trial, it was decided to perform the operation in all cases of progressive hydrocephalus, even in those with an apparently hopeless prognosis. The present series comprises all cases of hydrocephalus seen in one unit at the Westminster Children's Hospital and The Hospital for Sick Children, Great Ormond Street, between October, 1954, and August, 1955. During this time there were 70 new cases at all ages up to 6 years. Of these, 20 appeared to be arresting spontaneously, so were not operated on. Of the remaining children, 4 died before operation could be done, and in 10, though treatment was required, it was abandoned because of active infective ventriculitis (8) or very gross thinning of the cortex (2).

In the 36 cases coming to operation, blockages were demonstrated at all the common anatomical sites (table 1), and were of varied ætiology. Many patients were in an advanced stage of the disease.

Investigations

Only those tests used in selecting cases for this operation or in assessing the results will be discussed here, though all the usual investigations for hydrocephalus have been carried out.

Circumference of head.—This is the most useful gauge of progressive hydrocephalus in all cases which still have some elasticity of the skull. It is estimated weekly, if possible by the same observer on each occasion.

Ventricular pressure.—This is estimated with the child quiet (if necessary, sedated) but not anæsthetised, and under these conditions we have achieved consistent results. It is less informative than measurement of circumference, but, taken in conjunction with this, it offers a satisfactory means of assessing improvement or deterioration in comparison with previous readings.

Subdural fluid should be sought at the time of ventricular tap. Its presence may be due, among other causes, to a hæmatoma or a natural ventriculostomy.

Thickness of cortex is estimated during ventricular puncture and confirmed by air studies.

Analysis of ventricular fluid.—Evidence of recent hæmorrhage or active infection are indications for delaying or abandoning the operation.

Dye-studies.—Estimations of urinary excretion of dye after ventricular or thecal injection are mainly used for localising the block (Laurence 1957) and are not essential in an operation where this is not important. They have been used in a few cases to demonstrate improved excretion after a successful operation.

Method

Design of Apparatus

Drainage is achieved by means of a plastic tube passed through the cerebral cortex from a lateral ventricle to the supratentorial subdural space. On several occasions, where various forms of drainage from a ventricle to another part of the body had failed, it was observed that failure was usually due either to blockage of the *distal* end of the tube (the proximal end remaining patent), or to displacement of the *proximal* end from the ventricle. Accordingly, the tube was made with a deeply grooved cover on the distal end and a self-retaining proximal end (fig. 1).

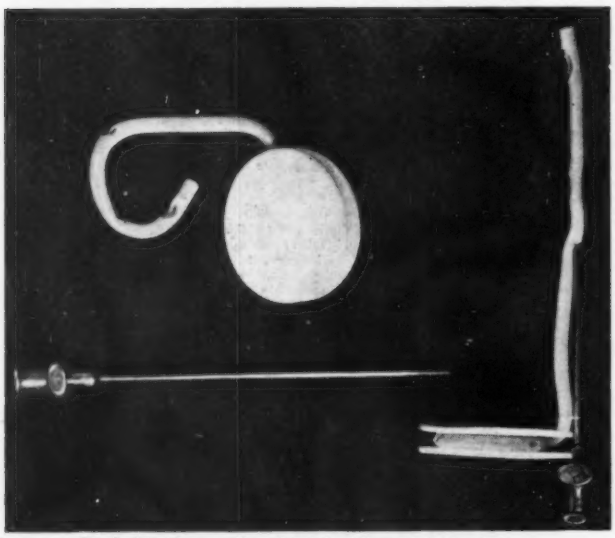

Fig. 1—The Forrest disc with and without stylet in place.

Plastics are the obvious materials to use, but there is some difficulty in choosing one with the required characteristics of flexibility, elasticity, and ease of moulding and of sterilisation. Most important of all, the material must not produce a foreign-body reaction, or the tube will become blocked. 'Polythene' has been widely used in similar procedures, and the first 11 operations were performed with discs of this material. In those cases which failed, however, the discs were seen to be blocked by heavy deposits of fibrinous or collagenous material, and polythene was discarded in favour of nylon, a much more physiologically inert plastic. All the remaining operations in this series were done with nylon discs, but more recently an even better material, polytetra-fluoro-ethylene, has become available. This is almost completely chemically and

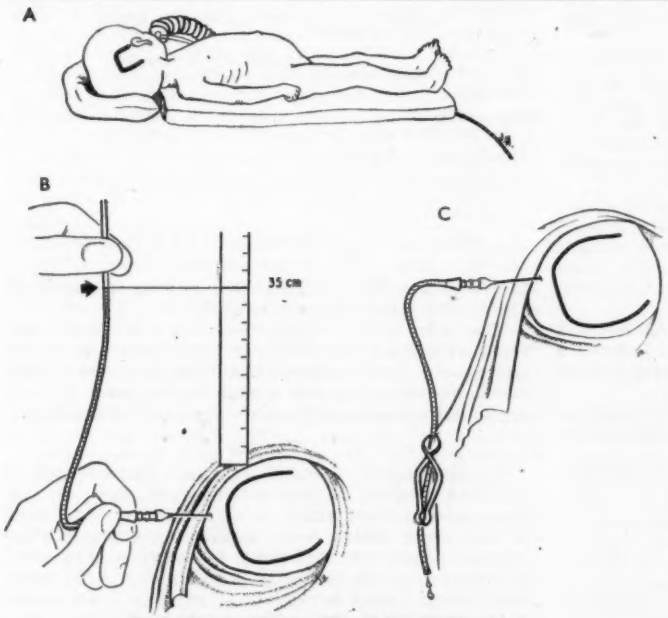

Fig 2—Stages of the operation as described in the text.

physiologically inert, has a high softening temperature, and is unwettable. The discs are now being manufactured of this plastic under the name of the 'Forrest Disc.' *

With all these materials the method of construction has been the same. The tube is shaped by passing a malleable wire through the lumen, bending to the required shape and then heating to the softening point of the plastic. After cooling, the wire is withdrawn, whereupon the tube resumes the curved shape. (This general method has wide applications in other surgical procedures where a tube of a certain curve or angle is required.) The disc portion of the device is turned up from solid plastic rod.

* Manufactured by Crane Packing Ltd., Slough, Bucks.

Operative Method

The actual insertion of the disc presents few difficulties; it is straightforward (fig. 2), and well tolerated by the patient. Since the first 2 cases we have found it unnecessary to provide intravenous fluid or blood during operation.

First, a short lumbar-puncture needle is inserted into the dependent lateral ventricle. A half-metre length of polyvinyl chloride tubing of 2 mm. bore is connected to it, and used as a manometer to measure the ventricular pressure (fig. 2B). The tube is then lowered to drain the ventricles (fig. 2C). While the dura remains intact, fluid is allowed to drip until the pressure falls to atmospheric, and this rapid decompression has been found not to disturb the patient.

An osteoplastic flap is next reflected, usually in the right posterior parietal region (fig. 2A). Sometimes the bone is thin enough to be cut with stout scissors but often it must be sawn in the usual manner. The posterior limb of the bone section should be made about a centimetre anterior to the occipito-parietal suture. If it is

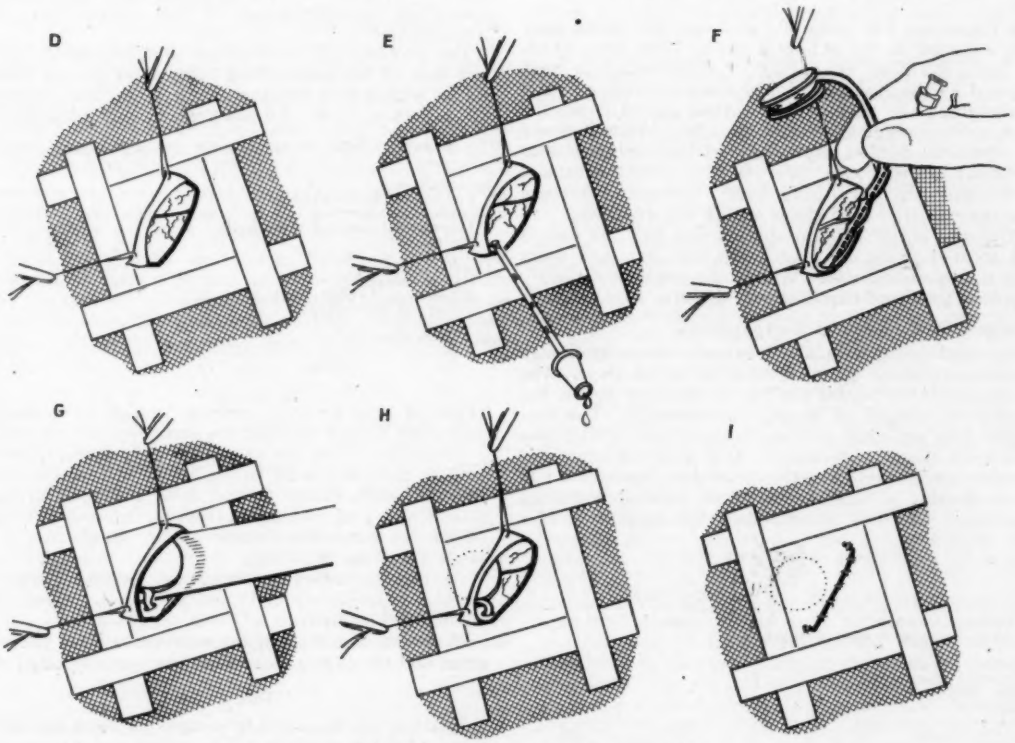

Fig. 3—The operation continued and concluded.

too close, the dura, which is adherent to the suture, may be inadvertently lacerated.

The dura should not be opened until the ventricular pressure has fallen to a low level and the dura is seen to be indrawn. If the skull is very thin this may not happen, because the sutures override and the skull collapses as fluid escapes. In these cases it is helpful to elevate the parietal bone by means of a blunt hook placed under the bone-edge.

When the dura is incised the brain should fall away, leaving a space about 1 cm. deep. Thus the dural incision can be enlarged to 3 cm. and the disc inserted without risk to the cortical vessels (fig. 3D). When the brain has fallen away sufficiently, the lumbar-puncture needle may be withdrawn from the fontanelle.

Selecting a bloodless area of the cortex near one end of the dural incision, the operator next passes a Jefferson's brain cannula into the lateral ventricle, to form a track for the insertion of the tube (fig. 3E).

Before the device is inserted it is absolutely essential to make sure that there is no bleeding and to rinse away

TABLE I—DESCRIPTION OF THE 36 CASES COMING TO OPERATION

A. Type

Communicating	17
Non-communicating	10
Unknown	9
Total	36

B. Site of Block

Aqueduct	5
4th-ventricle foramen	2
Basal cistern	12
Arnold-Chiari malformation	15
Unknown	2
Total	36

with Hartmann's solution all blood and clot which may have collected in the subdural space. The disc, which has been sterilised by boiling or autoclaving, is next prepared by the insertion of a blunt-ended hollow needle to straighten the tube, which is then passed down the track made through the cortex (fig. 3F). When it enters the ventricle, fluid is aspirated and then reinjected as the stylet is withdrawn, thus ensuring that the tube is not blocked with clot or brain tissue. The end of the tube then resumes its curled shape within the ventricle.

With the aid of a brain spatula (fig. 3G), the disc is now rotated under the dural flap (fig. 3H), well away from the operation site. When hæmostasis is certainly complete, the dural flap is closed (fig. 3I).

Postoperative Course and Complications

The postoperative course is usually smooth, though the temperature is often elevated for a few days. The infant should be nursed flat for twenty-four hours, but supportive therapy is usually unnecessary. The fontanelle does not often collapse in the dramatic way seen after some drainage operations. As it is almost impossible to make a watertight closure of the dura, there is a risk of a collection of cerebrospinal fluid forming under the skin flap. The risk is minimised by application of a

TABLE II—OPERATION RESULTS

—		No. of cases	%
Operation successful (arrest immediately after operation)		13	36
Operation not successful		23	64
Arrested subsequently	5		
Still progressive	1		
Dead	17		
Total		36	100

TABLE III—FATE OF THE WHOLE SERIES

—	Arrested	Progressive	Dead
Operation	18	1	17
No operation :			
Natural arrest	18	..	2
Persistent (i.e., infection)	..	1	7
Thin cortex	..	1	1
Death before operation	..	..	4
Total	36 (52%)	3 (4%)	31 (44%)

firm dressing, but, if fluid does collect, it should be aspirated before it becomes infected.

The only other complications we have seen were repeated slight intraventricular hæmorrhages in 1 case, and massive fatal cerebral thrombosis in 2 cases. Most of our patients were well enough for discharge fourteen days after operation if drainage appeared satisfactory.

Results

In following up cases of a disease characterised by insidious progress or spontaneous arrest, it is not easy to assess the effect which an operation has had. Some of our cases which were steadily progressive before operation have remained static for between twenty and thirty-two months since. It is this group alone which has been classed as successful. A few of the cases seemed to progress for a time after operation but have since arrested. These have been classed as failures in our series, though operation may possibly have prevented too much deterioration before spontaneous arrest.

Assessment has been by frequent checks, in which clinical impression, head measurement, and (in the majority) repeated ventricular-pressure readings have made a decision possible. In a few cases, dye-excretion tests and air studies have been used, and improved absorption or thickening of the cortex has been demonstrated.

The problem of classification was simplified by the fact that all the cases which failed after having drained did so within four months of operation, and nearly all within two months. All cases which succeeded for that

TABLE IV—CAUSE OF DEATH IN OPERATED CASES

Related causes :	
Progressive hydrocephalus	7
Intracranial infection	3
Intracranial vascular thrombosis	2
Operative	1
Unrelated causes :	
Gastro-enteritis	1
Inhalation of vomit	1
Intestinal obstruction	1
Unknown cause	1
Total	17

length of time are still arrested, though of course it is impossible to say whether the arrest will be permanent.

Of the 34 babies not operated on, hydrocephalus was arrested naturally in 20, as predicted. All these are alive and well now, except 2 who died, 1 congenital heart-disease and 1 of meningitis from an infected myelocele. Of the 14 progressive cases, 12 are dead, and 2 not expected to survive long.

Of the 36 babies operated on, hydrocephalus was arrested immediately in 13 and later in 5. These 18 are all still well (table II).

Tables III and IV show the survival-rates of the whole series and the causes of death in the cases operated on.

Discussion

Little would be gained by comparing these results with those of other workers. The criteria of success must

differ widely in different series (here we are taking only the narrowest meaning—i.e., arrest definitely coinciding with operation). Also, we have made no selection of cases, operating on all with progressive disease in whom it was technically feasible to do so. This must have prejudiced results since many patients coming to operation were in an advanced stage of the disease. We think, however, that this approach was the correct one, for the experience gained in treating these children is now proving of value in a more discriminating selection for a new series.

In an attempt to devise a reliable method of selection, a dye-excretion test for the subdural space has been worked out. It was not used in the present series, but more recent work has shown a correlation between the percentage of dye excreted and the potential absorptive power of the space, and hence the prognosis for the operation in any particular case.

The operation has a wide field of application, being suitable for the treatment of obstructive hydrocephalus wherever the site of the block. Its sole requirement is a subdural space which will absorb sufficient cerebrospinal fluid and will continue to do so. Therefore, success cannot be expected in the presence of a subdural effusion, and the space will rapidly lose its absorptive power if operation is performed in the presence of recent ventricular hæmorrhage or infection. We have operated on patients whose cortex is almost paper-thin but, apart from other considerations, the technical difficulty of placing the disc without damage to the cortex makes these cases almost hopeless.

In failed cases, it has usually been found that the disc, and sometimes the subdural space itself, have become occluded by adhesions. More rarely, the disc has been found patent but the subdural space lined by a membrane and filled with unabsorbed fluid. In either case, the cause can usually be shown to be due to the presence of blood or low-grade infection.

The fate of all the cases seen during the period of this series has been analysed to show that the success of the operation does not depend to any significant degree on natural arrest, since these cases have largely been eliminated before operation. The figure of 36% success for the operation series, not in itself very striking, must be considered in the light of the total arrest-rate of 52% for the whole series, and it must be remembered that the successes in the operation series were obtained from material from which many of the more favourable and only a few of the worst cases had been eliminated.

In the next series we hope to be able to show that selection of cases will lead to more predictable arrest. The number of operations performed is already large enough to show that, in a wide variety of hydrocephalic infants, arrest for a considerable length of time can be produced.

Summary

An operation for hydrocephalus is described and a previous report amended. The operation consists in the insertion of a plastic device through the cerebral cortex to provide drainage from the lateral ventricle to the overlying subdural space.

A series of 36 operations on cases selected from 70 hydrocephalic infants is presented and the results discussed. 13 of the operations seem to have arrested the disease.

The results suggest that the method may be of value in many types of hydrocephalus, especially after selection by subdural dye-excretion studies.

We wish to thank our colleagues at both hospitals for their coöperation. One of us (K. M. L.) acknowledges the support of the research committee of The Hospital for Sick Children, Great Ormond Street. Thanks are also due to Mr. D. Martin of The Hospital for Sick Children for fig. 1 and to Miss J. Hassell, the medical artist at the Westminster Medical School, for figs. 2 and 3.

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THE TRANSFER OF BLOOD BETWEEN BABY AND PLACENTA IN THE MINUTES AFTER BIRTH

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IN 1801 Erasmus Darwin wrote:

"Another thing very injurious to the child, is the tying and cutting of the navel-string too soon; which should always be left till the child has not only repeatedly breathed but till all pulsation in the cord ceases. As otherwise the child is much weaker than it ought to be, a part of the blood being left in the placenta, which ought to have been in the child."

Since then many estimates have been made of the amount of additional blood which a baby may receive if the cord is not tied immediately. Assessments have been made by weighing the baby (Haselhorst 1929, Allmeling 1930) and from blood volumes, and from the amount of blood obtainable from the placenta (DeMarsh et al. 1942). Each investigator has found that a considerable proportion of the placental blood may flow into the baby or be trapped in the placenta according to the time of tying the cord.

Present Investigation

Continuous records were made of the baby's weight in the minutes after birth so that not only the amounts of blood but also the events determining its flow could be examined.

A semi-automatic weighing-machine was adapted to give a continuous record on a constantly moving drum indicating weight gain and loss. The machine stood on an adjustable trolley and could be raised and lowered. As soon as the baby was born he was put on to the pan in warmed blankets, and the recording pen was quickly brought near the centre of the chart by putting weights on the other pan. There was inevitably a delay, usually of 10–20 seconds, between the completion of birth and the start of the record.

The instrument was so sensitive that the baby's movements caused an oscillation and a thickened record. This had the advantage of showing the vigour of the baby's movements without obscuring the weight trend. Large oscillations and interruptions in recording were inevitable during resuscitation and were sometimes also caused by the baby's movements.

No attempt was made to hold up the flow of blood by constricting the cord while the record was interrupted or during the initial phase of getting the baby on to the pan. Since at this stage the blood usually flowed rapidly to the baby, the total gains recorded were probably less than might have been obtained by holding up the flow then. Recording usually continued until just before the birth of the placenta.

Changes of weight were recorded in 39 babies born by vaginal delivery and 11 born by cæsarean section. There were 33 boys and 17 girls. The boys outnumbered the girls possibly because weighing was stopped at the outset through anxiety for the baby more often in the case of girls than boys.

Pulsation in the cord was taken to indicate partial or complete patency of the cord arteries. Because this was not seen to recur once it had ceased, blood was considered to flow only through the umbilical vein after cessation. The records of weight change after vaginal deliveries showed that though the flow was mostly towards the baby, rapid loss from the baby to the placenta also often took place, sometimes but not often

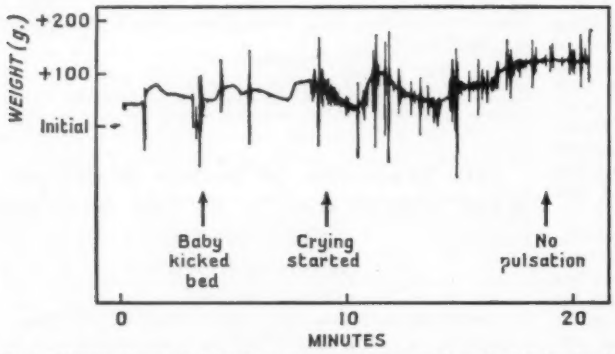

Fig. 1—Weight changes in baby lying at level of vulva, with cord pulsating for 19 minutes. Note weight changes induced by uterine contraction and relaxation.

equalling or even exceeding the gain. When the umbilical arteries were open, such loss may have been due to the pumping up of the placenta from the arterial side or be due to venous loss and no distinction could be found to indicate which was happening, except that where pulsation was present loss was more frequent.

To find whether siphonage played any part in the interchange of blood, the weighing-machine and the baby were racked up and down to about 15 cm. above and below the level of the mother's vulva when the baby's weight was steady.

Figs. 1–3 illustrate the events in three instances where the cord was pulsating during all or nearly all the period of tracing.

In fig. 1, with the baby kept at the level of the vulva, the successive gains synchronised each time with a uterine contraction, which was shown by the small increased loss at the introitus. In this record the dominant effect of uterine tone is so clear that the baby's weight record had become virtually a plethysmograph of uterine activity.

In the record shown in fig. 2 two gains were accompanied by uterine contraction, but there was no weight-loss even though the baby was raised and lowered, once stability had been reached.

Fig. 3 shows an instance where a baby who was slow to cry gained and lost and gained again before crying was established, the timing of the changes being different from those in figs. 1 and 2.

Fig. 4 shows part of a tracing where pulsation had ceased and the weight, though still slightly increasing,

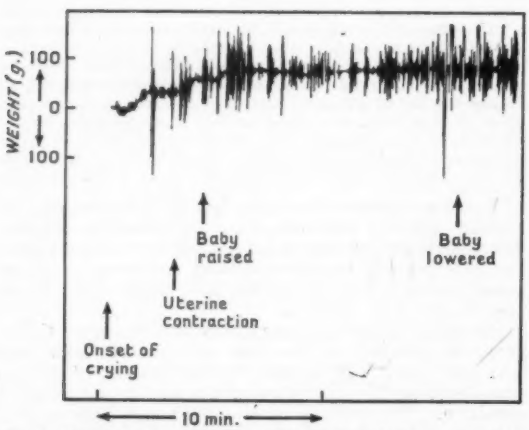

Fig. 2—Stepwise weight gains associated with uterine contractions. Cord pulsation throughout. No change resulted from raising or lowering baby.

was almost steady. The baby was then raised above the level of the vulva (the broadened record represents the vibration of winding the pan up). It will be seen that a loss of weight started as the baby's position was altered and continued until the pan was quickly lowered to below the original level. The succeeding gain when the baby was below the level of the vulva slowed as the baby started an outburst of crying; the subsequent tracing shows a slow steady gain. The loss of 26 g. and the gain of 58 g. brought about by small hydrostatic changes due to the baby's position show how a baby may lose blood through being held above the level of the placenta. In this instance the loss was cut short by altering the baby's height and was not necessarily maximal. Clear evidence of loss and gain through venous siphonage was seen in 5 cases in the 19 where trial could be made.

The weight changes in 11 babies born by cæsarean section were recorded despite the difficulties of the circumstances. The baby was put on to the pan and the weight charted intermittently between frequent phases of resuscitation (fig. 5) (after its delivery the placenta was put in a tilted kidney-dish and taken, together with the baby and the apparatus, to another part of the theatre). These records are therefore less detailed. They fall into two contrasting groups (fig. 6):

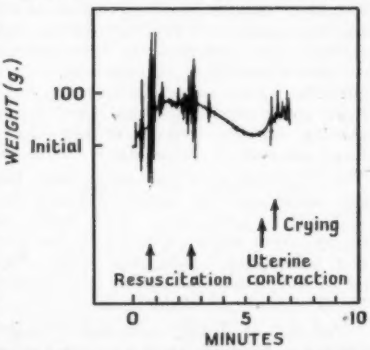

Fig. 3—Large early weight gain succeeded by loss and small gain. Cord pulsating throughout. Baby at level of vulva.

(1) 3 babies were large and vigorous and recording was continued conveniently. The increases observed included 3 of the 4 greatest seen in this investigation (125, 130, and 180 g.).

(2) In the other group the birth-weights were, with one exception, under 3·5 kg., and the signs of vigour were delayed; so the recording was cut short, but even in the period of observation a stationary phase appeared to have been reached. None of these babies received more than 55 g. of blood.

Discussion

These records confirm once more that, if the cord is left untied, a baby will usually increase his blood volume by a significant amount. The weight of blood received by these babies, as in Haselhorst's (1929) and Allmeling's (1930) work, was roughly correlated to the baby's weight (fig. 6), ranging from 0·8 to 4·7% of the body-weight. If the blood of the neonate weighs about 10% of the body-weight the amount of blood involved can probably be more than 40% of the baby's blood volume.

Little is known of what determines how much blood the baby's body will accept. The amount of blood passing into the baby may be correlated to the baby's size because the size of the placenta is similarly related, and the amount of blood in the placenta depends on the size of the placenta. The changing resistance of the pulmonary vessels at the onset of respiration in the maturing embryo (which has been found in sheep by Born et al. [1955]) may be another contributary factor. Thin cords appear to go white and cold sooner than thick ones, and transfer ceases soon after the cord is white.

The baby's size is not the only determining factor, because some of the records showed a cessation of flow while the cord vessels were still functioning, as if a main reservoir had been filled. For instance, fig. 4 shows that, after siphonage out, the blood flowed in fast at first when the baby was put below the level of the placenta; but, when the gain reached a point lying more or less on the projection of the original weight line, the gain slowed suddenly and continued as before from there. In that case the loss and gain were known to be venous and the inflow was at a rate of 60 g. a minute. If the circulation time in a neonate is about 10 seconds (Lesser et al. 1952), this addition to, and the earlier subtraction from, the circulation are relatively small, but the definite limit observed suggests that the filling may have been partly set, perhaps, by the capacity of liver, lungs, and spleen.

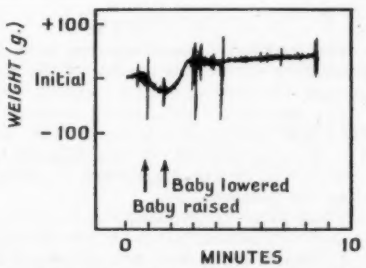

Fig. 4—Loss of weight from siphonage when baby was raised, and restoration when baby was lowered. No pulsation of cord.

The intake was also seen to be limited on a small scale by a certain sequence of events. In many records a relatively steep gradient showing flow into the baby, as in fig. 1, was followed by a burst of crying rather as, in transfusing a baby, crying is often induced by quickness of flow. Sometimes the crying had little apparent effect on the rate of inflow, but more often the raised intra-thoracic pressure of crying could be seen to be damming back the venous flow or even to be driving blood into the cord vein at the umbilicus when the cord had been previously empty. The immediate effect of crying may therefore be to slow the intake; yet the contrast between the two groups of babies born by cæsarean section implies that the lusty crying baby gains much while the baby not quickly putting its lungs into use gains little.

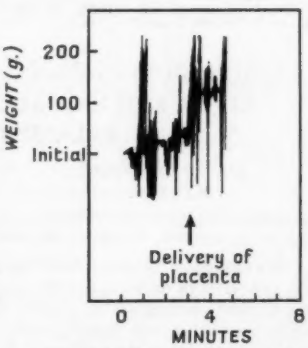

Fig. 5—Weight after cæsarean section.

We have, then, a picture of complicated hydrodynamics. After vaginal delivery the force of the uterine contractions, known to be about 60 mm. Hg in the second stage (Moir 1936), may squeeze the placenta. The baby's systolic arterial pressure of 69 mm. Hg (Holland and Young 1956) tends to distend the placenta and does so rapidly while the umbilical arteries are patent and the uterus is relaxed. The blood in the umbilical vein is hastened towards the baby by uterine contraction but, when uterine tone is poor, may flow in either direction, which is determined by small changes in pressure, such as those induced by 15-cm. difference in height (12 mm. Hg) and by changes in intrathoracic pressure.

In addition it is probable that the physiological mechanisms in newborn lambs described by Dawes et al. (1953, 1955, 1956) and Born et al. (1955, 1956) have their counterpart in man, and that the interplay of pressure changes and the patency of the foramen ovale and the ductus arteriosus and the calling up of autonomic effects by asphyxia with quickened umbilical arterial flow alter and are altered by the nett flow of blood.

Most important of all, presumably, are the interaction and interdependence of the inflation of the lungs and the increasing circulation in them. Jäykkä (1957), who subjected the lungs of stillborn babies to constant inflation down the trachea and constant reduced pressure surrounding the lungs, showed that the distension of the lungs was greatly aided by distending the pulmonary arteries (in his work at 80 mm. Hg). It seems that, for the establishment of breathing, the ample filling of the right side of the heart and also perhaps reversed flow in the ductus should occur with the phases of attempts to distend the thorax. Although the venous inflow is halted by the expiratory efforts of crying, over a period of time the distension of the lungs would be promoted by the existence of a reservoir to feed into the circulation.

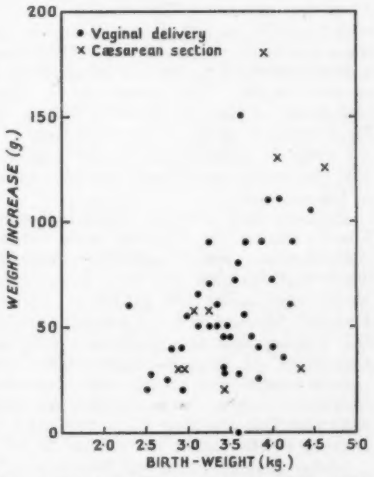

Fig. 6—Relation of weight gain to birth-weight.

If the inflow is important not only for increasing the amount of blood but also for expanding the lungs, delay in tying the cord has to be viewed slightly differently. With a brief delay the obstetrician may be helping the baby to 50 g. of blood; with a longer delay there may be an alternation of events which benefits the child even more. Possibly there is here a principle of intermittency.

Further work should show whether the incidence of pulmonary syndrome of the newborn can be reduced by allowing this reservoir to operate. Bonham Carter et al. (1956) have already shown that the child who survives the condition has the capacity to increase his caval pressure. The added risk of pulmonary syndrome in delivery by cæsarean section (Bound et al. 1956) may be due to the draining to which nearly all babies so born are subjected; because at cæsarean section the baby is usually held well above the mother's abdomen,

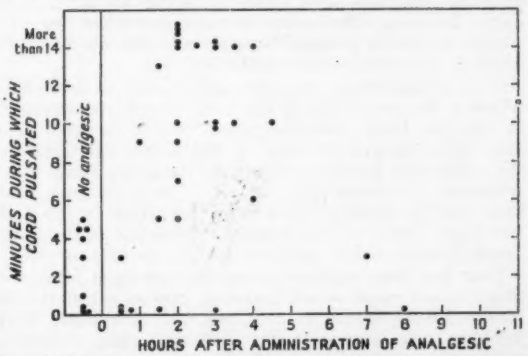

Fig. 7—Relation of duration of pulsation of cord to administration of analgesics in labour.

the intra-uterine pressure being roughly that of the atmosphere. The cord vessels are conspicuously distended. Loss of blood into the placenta is almost certainly fast and large, and the baby loses not only what would have been transferred to him if tying had been delayed but also an additional amount flowing in both cord vein and arteries into the unsqueezed placenta. Usually the cord is cut near the baby, a practice which deprives him also of the 10–15 ml. of blood in it. Many surgeons now hold the baby at table level to avoid siphonage. Landau et al. (1950) suggested delaying the tying of the cord and slinging the placenta in a towel above and beside the baby in the cot to allow passive transfer to continue.

Siphonage and arterial loss are also almost inevitable when the mother is delivered in the lithotomy position and the baby placed on her abdomen, unless an oxytocic drug has been given. Löhne (1943) recommended that babies delivered by forceps should be put below the level of the vulva. This procedure is also probably very important to the first born of twins; at their birth the large relaxed uterus cannot be treated with oxytocics; for them the cord should be left untied until it is white and the uterus contracted, the baby lying below the level of the placenta.

Holland and Young (1956) describe persisting low blood-pressure in infants after breech and forceps deliveries and, more especially, after cæsarean section. Their findings may well be a measure of the draining to which the babies are subjected where an analgesic is keeping the cord arteries patent, anæsthesia has relaxed the uterus, and the position of the baby is allowing siphonage. I have been repeatedly surprised that the baby's condition gives no indication of the loss of blood into the placenta. Obstetricians can so easily be unaware that blood is draining from the baby, and none would consent to the visible removal of 30–50 ml.

One argument often put in favour of delayed tying of the cord is the tradition that the baby born before the arrival of assistance thrives. In such a case the baby usually lies at a level lower than the placenta, the tying of the cord is not immediate, and the placenta (and the blood going to the baby) is kept warm in either the uterus or the vagina.

In most deliveries nowadays we cannot imitate what appears natural, because analgesics (pethidine and chloral in this work) given to the mother during labour prolong the duration of pulsation in the cord. Fig. 7 relates the duration of pulsation to the administration of analgesics. Since analgesics have such a definite action on the umbilical arteries, their possible effect on the closing of the ductus arteriosus and their effect on uterine arteries need to be reconsidered. The incidence of postpartum hæmorrhage among women receiving one analgesic should be compared with a group receiving none rather than with those receiving another. The delay between administration and its effect on the umbilical vessels presumably prevents the use of analgesics in the treatment of prolapsed cord.

This investigation was first undertaken to determine whether delayed tying of the cord would provide fluid to tide the baby over the period of dehydration. No clear evidence was obtained on this point, but certainly the additional blood is enough to be a significant contribution to the baby's nutrition: 100 g. is more fluid than a baby usually takes from the breast in the first two days; and the iron content is as much as the baby might be expected to get from milk in his first month.

Fear has been expressed that the increased intake of blood would cause severe jaundice, but only 1 of the 50 babies developed severe jaundice. It is unlikely that jaundice was prevented by increased renal secretion induced by greater fluid intake, because the weight losses in the first days of life were not unusual.

Summary

The transfer of blood between baby and placenta was studied by continuous records of the baby's weight after normal deliveries and after birth by cæsarean section.

The transfer of substantial amounts of blood to the baby was confirmed, but large losses were also observed and were attributed to loss through patent umbilical arteries and by siphonage when the baby was held higher than the placenta.

Three large vigorous babies born by cæsarean section gained very much, but the others little.

Pulsation in the cord was prolonged if the mother had received analgesics.

The findings are considered in relation to obstetric practice and neonatal respiratory physiology.

My thanks go to Sister K. M. Billing and to the obstetric staff of University College Hospital for their help in this work, which was assisted by a grant from the Medical Research Council.

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ACUTE SUPPRESSION OF URINE AND LIVER FAILURE ACCOMPANYING ECLAMPSIA

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SUPPRESSION of urine may have many causes, and we do not always understand its pathogenesis. It is a well-recognised complication, but we do not know why anuria following eclampsia has hitherto been almost invariably fatal either directly or through further complications.

Many cases of anuria treated conservatively have been described. Most of those from departments of obstetrics and gynæcology have followed abortion, incompatible blood-transfusion, antepartum hæmorrhage, or postpartum hæmorrhage.[2 8–11 16–19 21 23 24 26 28–30 34–37] Few detailed reports of anuria in eclampsia have been published, and a large proportion of the patients died.[12 19 21 24 25 29 35 36]

In the present case the patient developed anuria during eclampsia and was treated conservatively and recovered, probably because the renal failure was recognised early and conservative treatment, based on the lines of Borst, Bull, and others,[3–7 12 33] was started at once. We have been unable to find any published report of a case of this type treated in this way.

Case-report

The patient, aged 29, was admitted with severe pre-eclampsia at 9.20 P.M. on Feb. 10, 1956. This was her third pregnancy, and she had borne two children. Her two previous pregnancies had been normal and both deliveries spontaneous.

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There was no relevant medical history. She was 34 weeks pregnant and had had ankle œdema for the past three weeks and one episode of spots before the eyes. Both symptoms had subsided with rest in bed. She had had headaches during the past two days.

Examination

The patient was conscious. Her pulse and temperature were normal, and blood-pressure 220/120 mm. Hg. Œdema caused generalised puffiness of her face, and her finger rings were immovable. There was gross pitting on pressure from her ankles to half-way up her thighs. She had gross albuminuria, and her urine became solid when boiled. A single fœtus was palpable, with its breech presenting in the left sacro-anterior position, and its size was consistent with the duration of amenorrhœa. The fœtal heart was regular. No abnormality was found in the other systems.

Treatment and Course

A basal-anæsthetic dose of bromethol 6·3 ml. (0·09 ml. per kg. of estimated body-weight) in 217 ml. of water at 110°F was given rectally and repeated five hours later. Seven hours after admission the patient had an eclamptic fit, and a further 6·3 ml. of bromethol was given. There was a second fit at 7.45 A.M., and a further 6·3 ml. was given.

The blood-pressure had fallen to 130/110 mm. Hg (fig. 1), and at 10 A.M. a stillborn female was delivered spontaneously.

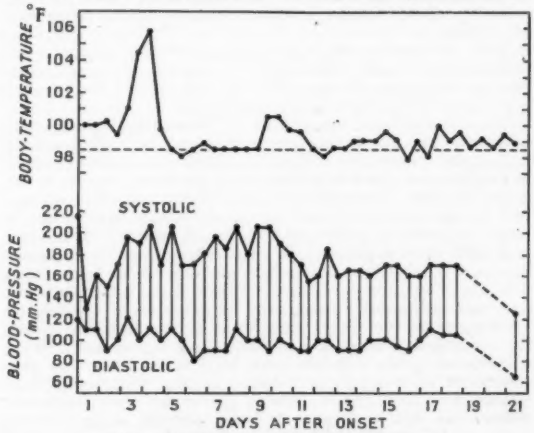

Fig. 1—Temperature and blood-pressure.

The third stage was completed in five minutes, and there was no abnormal retroplacental clot. There was therefore no evidence of accidental hæmorrhage.

Post Partum

Large doses of sedatives (phenobarbitone sodium gr. 3 and paraldehyde 10 ml.) were given intramuscularly in the next few hours, and the blood-pressure remained 130/100 mm. Hg. Seven hours after delivery the patient was jaundiced and had passed only about 8 oz. of urine since admission. Next day her blood-urea level was 55 mg. per 100 ml. (fig. 2) and serum-bilirubin level 22 mg. per 100 ml. (see table). The van den Bergh test gave a direct biphasic reaction. There were numerous red blood-cells but no crystals or casts in the first specimen of urine examined in the ward by us. Subsequent laboratory examinations revealed casts in addition to the red cells.

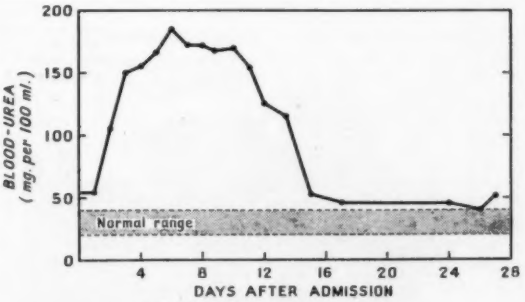

Fig. 2—Blood-urea levels.

The day following delivery the patient remained unconscious. A catheter was kept in situ and was released hourly, to see whether urine was being secreted. It was felt that repeated catheterisation would be necessary, and that this would be more likely to provoke urinary infection than would a catheter kept in the bladder. The facts that the patient was unconscious and that it was necessary to save and measure all the urine influenced this decision. No urine was obtained in eight hours in spite of intravenous fluids, which were given as 25% dextrose 1 litre plus a quantity equivalent to the previous day's output (fig. 3). The blood chemistry was estimated daily (fig. 4). For the intravenous transfusions into the arm was substituted a polyethylene cannula in the inferior vena cava by way of the saphenofemoral junction. Fluid requirements were calculated as before except that 40% glucose was used. Treatment with intravenous 40% glucose 1 litre a day provided 1600 calories. Amounts in excess of 1 litre were given as 5% dextrose. When the CO_2-combining power remained low, 1/6 molar sodium lactate was given from the sixth to the ninth day instead of some of the 5% glucose. An attempt was made to correct anæmia by transfusing packed cells. Intramuscular calcium gluconate was given because of the low serum-calcium level.

On the third postpartum day the patient's temperature rose to 105·6°F. This was first treated by tepid sponging, which proved ineffective. She was then cooled with damp sheets, the draught from electric fans, and ice applied to her body and extremities. Aureomycin 250 mg. was given into the drip. Her temperature remained raised for five days before settling to normal.

On the fifth postpartum day diuresis began, the patient passing 1300 ml. of urine in twenty-four hours. The jaundice was noticeably less (serum-bilirubin level 5 mg. per 100 ml.), and the patient spoke to the nurse for the first time. Her hæmoglobin was 55% (Haldane) (8·1 g. per 100 ml.) and 1 pint of packed cells was given slowly. This was not counted in the daily intake requirements.

Next day her general condition was improved and serum-bilirubin level was 2·2 mg. per 100 ml. She could take fluids by mouth, and the amount so taken was allowed for in calculating the daily requirements. From then on the amount of fluid given orally was increased until the intravenous route was discontinued on the ninth day post partum. A light diet was allowed but no protein until the blood-urea level fell below 100 mg. per 100 ml. on the fourteenth day post partum. A low-protein diet was then allowed. The jaundice disappeared, and the serum-electrolytes and serum-bilirubin levels returned to normal values.

LIVER-FUNCTION TESTS AND BLOOD-SUGAR LEVELS

—	Day after onset of failure									
	2	3	4	5	6	7	9	10	12	16
Liver-function Tests :										
Total protein (g. per 100 ml.)	4·9	4·5	3·5	3·2	3·2	3·8	4·3	4·8	5·1	6·2
Albumin (g. per 100 ml.)	2·5	..	..	1·7	..	..	..	..	..	..
Globulin (g. per 100 ml.)	2·4	..	..	1·5	..	..	..	..	..	..
A : G ratio	1·1 : 1	..	..	1·1 : 1	..	..	..	..	..	..
Thymol turbidity (units)	2·5	..	..	2·5	2·5	..	..	..	..	..
Thymol flocculation (units)	..	..	..	0	0	..	..	..	..	..
Serum-bilirubin (mg. per 100 ml.)	22·0	12·0	8·0	5·0	2·2	1·5	..	..	..	0·4
Prothrombin activity (% of normal)	70	..	81	72	72	72	..	..	..	..
Plasma specific gravity	..	1·018	1·017	1·016	1·016	1·018	1·019	1·020	1·027	..
Alkaline phosphatase (K-A units)	13·5	..	..	11·8	11·7	..	..	..	..	..
Blood-sugar (mg. per 100 ml.)	112	..	..	168	281	381	144	110	175	132

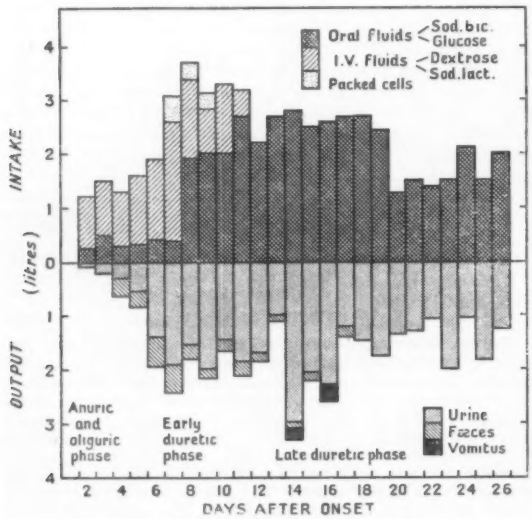

Fig. 3—Fluid-balance chart.

On March 7 the blood-urea level was 39 mg. per 100 ml., and the urea-clearance test showed 45% of normal function in standard urea-clearance. The specific gravity of the urine was 1·000–1·008. The patient was discharged on March 8, her blood-pressure being 160/80 mm. Hg.

Follow-up

The patient was readmitted a month after discharge. She was feeling well and had maintained her low-protein diet. Her blood-pressure was 125/90 mm. Hg. Her serum-electrolyte levels and liver-function tests were all within normal limits; her blood-urea level was 35 mg. per 100 ml. Her standard urea-clearance was 34% of average normal function, and her urine was concentrated up to 1·012.

Three months afterwards the specific gravity of the urine was 1·002–1·020 and the standard urea-clearance test 51% of normal function.

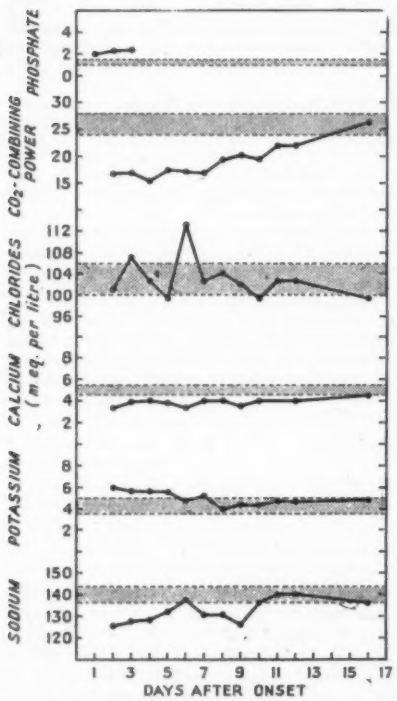

Fig. 4—Serum-electrolyte levels. Shaded areas represent normal range.

DETAILS OF TREATMENT

Liver and Kidney

The patient was first noticed to be jaundiced and oliguric seven hours after delivery, while still comatose. The small amount of heavily blood-stained urine and the accumulation of bile pigments in the plasma indicated renal and hepatocellular damage. To protect the liver and kidneys, a 25% glucose infusion was started into an arm vein, and 1 litre was given in twenty-four hours. Digoxin was added to this because of the congestive failure shown by the raised jugular venous pressure and gallop rhythm.

Thirty-six hours later it was realised that this situation might continue for some time, and the infusion into the arm vein would not be able to continue indefinitely because of the risks of local thrombosis and inadequate caloric intake. Accordingly it was decided to give fluids into the vena cava. Therapy by glucose/peanut oil intragastrically was not contemplated, because of coma and possible vomiting. The inferior vena cava was chosen because access to it by cutting down on to the saphenous vein close to the sapheno-femoral junction was thought to be easier for those inexperienced in the technique. Moreover only ordinary polyethylene tubing was available, whereas a proper cardiac catheter was thought to be essential to pass the subclavian arch to reach the superior vena cava. However, since then it has been pointed out (G. M. Bull, personal communication, 1957) that it is quite easy to put a polyethylene tube into the superior vena cava via the antecubital vein. It is just pushed until roughly the right length is in, and then its position is checked by manometry as follows: if there is an inspiratory lowering of pressure it is in the thorax or the neck; if an inspiratory rise it is too far (in the inferior vena cava). If it is in the neck a Queckenstedt sort of test will reveal this; if in the right ventricle there will be a higher mean pressure than there should be.

It is neither hazardous nor difficult either to set up or to maintain an infusion into the inferior vena cava. Considerable discussion and speculation preceded our use of it, but experience soon showed it to be quite simple.

Since the patient was not fit to be moved, the operation was done, with her in bed in her side-ward, under fully aseptic technique. Through a two-inch incision the upper end of the left saphenous vein was exposed and the distal part ligatured. A no. 4 polyethylene tube was introduced into the proximal end for about ten or eleven inches and tied in with a double catgut ligature. A further deep nylon suture was inserted and tied over a gauze pad. By this means the patient's intake of fluids and calories was maintained for seven days. Heparin 2500 units per litre was added to the drip as a harmless and necessary precaution. Prophylactic aureomycin 250 mg. daily was given, sometimes by direct injection into the polyethylene tube, and at other times it was added to the transfusion bottle. It has since been realised that we gave too much aureomycin and risked getting dangerously high blood-levels in a patient whose glomerular filtration mechanism was not working. A more rational régime, which would be followed in a future case, would be to give a loading dose of 1 g. aureomycin and thereafter 250 mg. every four days, or alternatively to stick to the simpler and safer penicillin, given as 1 mega unit followed by 0·25 mega unit on alternate days. The need for preventing infection at this stage has been emphasised by Bull [5] and others.

In dealing with a case of this severity for the first time it is necessary to keep very accurate fluid-balance charts; and it is important that one member of the team should be responsible for sending specimens of blood to the laboratory at the same time each day, receive the results personally, and provisionally order treatment for the next twenty-four hours. This minimises the chance of confusion, as has been pointed out by Scott Russell et al.[27]

Renal failure was recognised early, but a prompt decision to start treatment cannot be overemphasised. This is more likely to succeed when the complication is anticipated.

Hyperpyrexia

When her temperature reached 105·6°F on the third day the patient appeared moribund. Energetic measures were needed because ordinary tepid sponging had not helped. She was stripped and covered with a wet sheet, and the draught from open doors and windows was augmented by electric fans. Her limbs and trunk were then packed with plastic theatre-caps filled with ice cubes. As the covering sheet became dry it was easily moistened by cold water from the ice bags.

A small brain-stem hæmorrhage following the eclampsia was considered to be the cause of the hyperpyrexia.

Eclampsia

The only deviation from the usual therapy of bromethol and general nursing was that bromethol was repeated on three occasions after the first dose—i.e., a total of 25·2 ml. in about twelve hours, including an unknown amount that was not

retained. This was possibly excessive and may have been responsible for some damage in a liver already affected by eclampsia. Slow detoxication of the bromethol may have added to the subsequent coma.

Morris [22] did not find evidence that oliguria was a complication of bromethol treatment.

Electrolyte Balance

The deviation from normal of the blood-electrolyte levels was fairly severe, but they never reached levels of extreme danger. Some were nevertheless abnormal enough to merit comment.

Potassium.—The initial hyperkalæmia was effectively controlled by the protective action of the hypertonic glucose,[5] and alternative measures were not required. Hyperkalæmia is always to be feared; it prolongs the P-R interval and lengthens and elongates the Q R S segment. An electrocardiograph is necessary to demonstrate these changes.[33 36] Hyperkalæmia may be minimal, but the excess potassium in the blood may have been sufficient to act harmfully on the heart. Such damage may be detected electrocardiographically, whereas estimation of the serum-potassium level alone might not show sufficient abnormality to suggest myocardial changes resulting from it. Digoxin should then only be given if congestive failure is severe and there is no sign of reduced myocardial conductivity.

Alkali reserve.—The acidosis persisted until sodium lactate was given intravenously. Sodium lactate could perhaps have been given at an earlier stage to this patient, but the question arose of administering sodium to an œdematous patient. It was considered wiser not to give it as lactate intravenously in the early stages but to wait and see if the acidosis would correct itself. When this did not happen, even after concentrated sodium bicarbonate had been given orally, we decided to observe the effect of 1/6 molar lactate, estimating the alkali reserve daily. The response was good (fig. 4), and there was no sign of retention of sodium; but much of the œdema had subsided by the time this stage was reached. There is controversy about whether sodium lactate should be given to correct acidosis in the presence of œdema; we steered a middle course without disadvantage. We feel that each case should be judged on its merits; and, if sodium lactate is given, one should be ready to stop it whenever signs of retention of sodium appear.

Calcium.—The serum-calcium level fell and tetany was feared. Therefore 10% calcium gluconate 40 ml. was given daily. The intramuscular route was chosen as being safer than the intravenous. The hypocalcæmia is compensatory to retention of serum-phosphate when there is no renal function, and was to be expected. Calcium has an effect on the myocardium about opposite to that of potassium; it therefore seemed logical to give calcium to the patient.

Blood-transfusion

When the hæmoglobin was found to be 55% (8·1 g. per 100 ml.), a pint of packed cells was given. Opinions differ about whether this should be done, Bull [5] being in favour and Sheehan [33] against. No rise or fall in serum-potassium level was detected after the transfusion.

Vena-cava Infusion

The vena-cava infusion was stopped after seven days, when the patient had recovered clinically but the specific gravity of the urine was still only 1·010, showing that selective reabsorption had not yet been restored, although glomerular function was adequate. Subsequent renal function may have been improved had this infusion been maintained another week, but some authorities suggest that concentrated glucose solution may have toxic effects on the kidneys. For that reason it was discontinued as soon as possible.

Signs of liver failure following eclampsia are uncommon, and the cause is obscure, but a large supply of glucose is known to exert a protecting influence. An adequate intake of vitamins was given, as recommended by Bull.[5]

PROGNOSIS

Eclampsia

The recurrence-rate of eclampsia alone is about 10%.[14]

Renal Function

Since the patient can concentrate urine to 1·020 and the urea-clearance rate is rising, the prognosis for the renal lesion is favourable. Eclampsia does not appear to cause permanent renal damage.[15] An insufficient number of women have yet recovered from acute suppression of urine for a more accurate prognosis to be given.

Liver function.—This quickly became normal, and the regenerative capacity of the liver is well-recognised.

Discussion

It is now generally agreed that the conservative régime should be started as soon as anuria is recognised, so that the patient's *milieu intérieur* never becomes so abnormal that she dies before renal function is restored. This treatment is rational because the kidneys of patients who die on the eighth to twelfth day of anuria commonly show active regeneration of tubular cells in the injured areas. Anatomical and functional repair of the kidneys may take place if the patient can be kept alive long enough. Treatment aims at reducing the breakdown of cell protein to a minimum, thereby diminishing the rate of accumulation of metabolites—e.g., urea—and of potassium in the blood. It is the increase in extracellular potassium which usually kills the patient.[5]

Ætiology of Anuria

The general medical and surgical causes of anuria have been enumerated,[13] and the obstetric ones analysed.[6 32 35] Terminology used in defining anuria has varied between anatomical, symptomatic, and ætiological. Among the names used more or less synonymously have been the following: acute renal tubular failure, lower-nephron nephrosis,[20] acute tubular necrosis, acute nephrone nephrosis,[1] crush syndrome, transfusion kidney, and traumatic uræmia. Possibly the name of choice, when eclampsia is involved, is merely "acute suppression of urine," because it involves no theory of pathogenesis.

When anuria in obstetrics is classified into ætiological categories of shock, excretion of abnormal pigment, and circulating nephrotoxic substances,[35] it is at once seen that all the causes except eclampsia would easily find their place in a list of the general medical and surgical causes of anuria: some (e.g., accidental hæmorrhage, postpartum hæmorrhage, ruptured uterus, incomplete abortion, and ectopic gestation) are similar to such causes; and others are medical conditions that happen to obstetric patients (e.g., incompatible transfusion, hæmolytic drug-reaction, sulphonamide or quinine sensitivity, mercurial poisoning, and septicæmia). Thus pathogenesis of the "shock" causes may be explained as renal ischæmia and its nine grades of lesion according to degree and severity,[31 32] that of the other causes being damage to tubular epithelium by pigments and toxins preventing selective reabsorption of the glomerular filtrate; but where eclampsia comes in this classification is uncertain. Slowinsky [25] puts it among the nephrotoxic agents as "? toxins of eclampsia and pre-eclampsia." But what the toxins are is unknown, and where they exert their influence is undiscovered. Until further light is shed on the subject, it could be suggested that renal failure in the present case of eclampsia followed the pattern of that in shock, the renal ischæmia arising from spasm of the renal arterioles and capillaries.

The rôle of the hypothetical toxin is unknown. We are certain that our patient did not suffer enough shock to make her anuric, because her blood-pressure was always above normal. There was no evidence of concealed accidental hæmorrhage [40] either before she became unconscious or after delivery, and she did not have a postpartum hæmorrhage. Blood-transfusion, sulphonamide, and quinine therapy were never used, and there was no evidence of any other intoxication. We conclude that her renal failure could only have been of eclamptic origin.

The cause of renal failure is leakage of glomerular filtrate through the walls of the damaged tubules instead of being concentrated and transported by them.

It has been said that the importance of oliguria and anuria in obstetric cases may sometimes have been unrecognised previously. This may be due to the overwhelming nature of other aspects of the case, the speed with which patients succumbed, or the lack of standardised rational routine of treatment.

Summary

A case of fulminating pre-eclampsia progressing to eclampsia and stillbirth while under bromethol therapy is described.

Renal and hepatic failure followed, the patient remaining unconscious for five days.

Her brain-stem appears to have received damage, which was reversible.

Concentrated glucose was given into the inferior vena cava, the electrolyte equilibrium was carefully controlled, and hyperpyrexia was reduced by physical cooling.

We wish to thank Mr. T. B. FitzGerald for permission to publish; Dr. D. A. K. Black for helpful advice during treatment; and the nurses for the skilful attention they gave this patient.

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Reviews of Books

William Harvey

His Life and Times: His Discoveries: His Methods. LOUIS CHAUVOIS, Lauréat de l'Institut et de l'Académie de Médécine. London: Hutchinson Medical Publications. 1957. Pp. 271. 25*s*.

IN this tercentenary year of Harvey's death, many doctors and medical students will want to learn more of his life and times, his discoveries and his methods, and in this book Dr. Chauvois, a distinguished French physician and medical historian, has provided exactly what they want. He has carefully studied and sifted all the available information, and he has inspected all the memorials of the great man. An accomplished scholar, he has also examined the Latin texts of Harvey's published writings. From these materials, his balanced judgment has produced a life-like portrait of the man and the scientist. He has not hesitated to use deliberate fiction when that can be done without going too far from probability. Thus, he describes a journey from Padua to Venice when, as an undergraduate, Harvey reviewed and criticised in his mind current ideas about the circulation of the blood; and there is an account of a typical day with Harvey in the year before *De Motu Cordis* was published. There are some factual errors in the text, but they detract little from its merit.

Much of the text is quoted from D'Arcy Power's biography, but Dr. Chauvois is sometimes critical of Power's views. For example, he insists that it is not enough to read Harvey's book to appreciate properly his teaching, and that the two letters to the unbelieving Riolan, written in 1649, are even more important. Power and others believed them to be of secondary interest.

"In the Letters we have the same affirmations, the same demonstrations of the way the heart works, of the functions of the arteries, of the return of the blood by means of the veins—in a word, the same description of the circuit but with overwhelming answers to all possible objections. Despite his seventy-one years Harvey still shows himself to be an admirable dialectician, though one who always relied upon observation and upon carefully executed experiments."

This important and very readable book, written with much charm and well illustrated, deserves many readers.

Methods in Enzymology

Vol. III. Editors: SIDNEY P. COLOWICK and NATHAN O. KAPLAN, McCollum-Pratt Institute, The Johns Hopkins University, Baltimore, Maryland. New York: Academic Press. London: Academic Books. 1957. Pp. 1154. $26.00.

THE third instalment of this Herculean publication surpasses by some 200 pages the larger of its two predecessors. A subtitle says that it is devoted to the preparation and assay of substrates, and this definition includes, of course, most of the organic compounds found in living matter. Much of the book, therefore, has interest and application outside what might be regarded as the rather esoteric province of the pure enzymologist. Thus, the discussions of analytical procedures for the nucleic acids, sugars, amino-acids, and lipids provide excellent introductory reading for anyone faced with estimating one of these substances for the first time. Quite apart from forming a valuable new unit in the series to which it belongs, this book is a helpful source of information on many topics in quantitative biochemistry. The final volume promises to deal with biochemical methodology in a still more general way.

Dextran and its Use in Colloidal Infusion Solutions

ANDERS GRÖNWALL, M.D., professor of clinical chemistry, University of Uppsala. Stockholm: Almqvist & Wiksell. Oxford: Blackwell Scientific Publications. 1957. Pp. 156. 20*s*.

A PLASMA substitute must be a harmless colloidal solution of a substance whose molecular size gives it an appropriate osmotic pressure in the blood-vessels. Dextran is a viscous polysaccharide produced in cultures by certain micro-organisms, particularly some leuconostoc species. By purification and degradation processes, dextrans can be prepared which are useful plasma substitutes for intravenous infusion, and this book is an excellent account of the development of clinically useful dextrans and of the historical background. Chemical and physical theories are clearly enunciated, and clinical applications and toxic manifestations well described. Despite some awkward passages of translation the style is generally very clear.

Current Therapy (Philadelphia and London: W. B. Saunders. 1957. Pp. 690. £3 17*s*.).—The new edition of this annual, edited by Prof. Howard F. Conn, has nearly succeeded in the almost impossible task of keeping itself fully up to date: thus, though perchlorate for hyperthyroidism and hypophysectomy for breast cancer are not mentioned, there are good accounts of the hypoglycæmic sulphonylurea compounds and the newer hypotensive drugs. Its scope encompasses all non-surgical disease and a few surgical and obstetric conditions. The authors' recommendations are in the main dogmatic and orthodox, though the account of treating venous thrombosis by surgical removal of the clot is intriguing. The list of ingredients in commercial products could be invaluable in a poisoning emergency.

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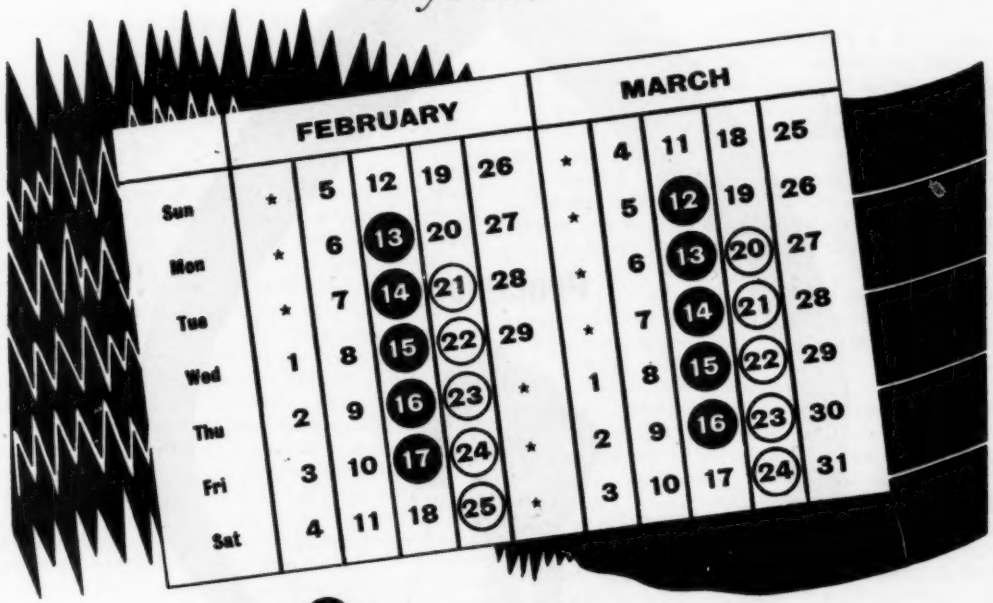

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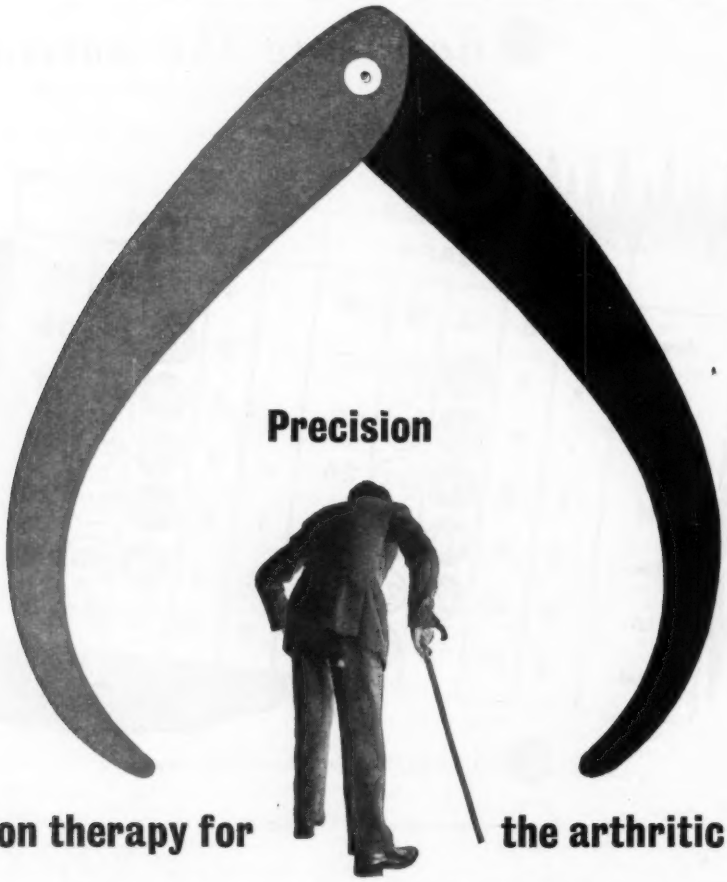

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Conclusion:

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THE LANCET

LONDON: SATURDAY, JUNE 22, 1957

How Many are Chosen?

WITH the post-war ex-Service bulge behind them, and with the prospect from 1960 onwards of a considerable increase in the numbers reaching the age of 18, the Committee of Vice-Chancellors and Principals has prudently taken stock of the relative numbers of successful and unsuccessful applicants for university entrance in the recent past. In 1952 they appointed a subcommittee,[1] with Sir JAMES MOUNTFORD, of Liverpool University, as chairman, to investigate the nature and fate of applicants for entry; after careful planning, a detailed survey was made of applicants and entrants to almost every university in the United Kingdom for the session 1955–56. The main object was to ascertain "whether the number of places was inadequate, adequate, or in excess"—a matter of interest to parties as diverse as the Chancellor of the Exchequer and the heads of schools, as well as to university staff. Fortunately, the scope of the inquiry was widened to obtain "information about the previous educational background of the applicants, their social classification, the sources of their financial support, and the careers which at the time they made their application they proposed to pursue." The subcommittee's report,[1] written by Mr. R. K. KELSALL, and published last week, is described in the *Times* by Sir JAMES MOUNTFORD[2] as "based on the first large-scale investigation of its kind ever attempted," and thus "a matter of considerable public interest." The figures now made available bring some precision into an area previously occupied only by opinion, or rather by opinions; for some thought that worthy applicants were being turned away in droves, while others thought that every suitable applicant would find a place, though not necessarily in the university of his first choice. As the preface to the report says, "Opinion, in a matter of this kind, is no substitute for facts."

Of 31,000 applicants, about 18,000 were admitted in October, 1955; the 13,000 applicants not admitted included 2000 from overseas. Of the 11,000 home applicants who did not succeed in 1955, no less than 4000 had been accommodated by October, 1956; and of the remainder, about half had failed to enter, not as the result of an arbitrary decision, but through sheer lack of the minimum educational requirements for entry. There was, it is true, a residuum of 2000–2500 applicants who had obtained the minimum requirements for entry but had not gained a place; and there was a similar number of unfilled places: but unfortunately the vacant places were mainly square and the candidates round, or vice versa. A substantial number of places—over a thousand—was vacant only by default, having been offered to applicants who had gone elsewhere. The general picture, with 94% of available places filled, is not unsatisfactory. As Sir JAMES MOUNTFORD says: "It is not reasonable to expect that places and applicants can ever be so perfectly matched that there will be no vacancies: nor is it to be expected that universities will feel it right to accept every applicant who has secured just the minimum of marks to bring him into the category of 'qualified' as that term has necessarily had to be used in this inquiry." The *Manchester Guardian*[3] stresses the low proportion of "working-class children" among the applicants (28–30%, compared to 72% of manual workers in the adult male population). Fortunately, there was no material difference between the proportion of manual workers among the parents of those admitted and those not admitted; so discrimination by the universities could be ruled out. The report also gives evidence that hereditary factors are much less important than the combined effect of "differing environmental influences and parental aspirations"; and the *Guardian* draws one possible moral—that these are "circumstances that will have to be overcome."

The medical reader will naturally be curious to know how the applicant for a medical course compares with other applicants in his social background, his previous education, and—more critically—his hopes of admission. Those who claim that medicine is no longer a popular choice of career can draw no bitter confirmation of their views from the 1955 figures. Multiple application was commonest among medical applicants, and failure to accept a place when qualified to do so was rarest. Among the sons of doctors, 51% of those admitted were entering the medical course; and doctors' sons made up 17% of male medical students. Among medical students, a lower proportion had been to local-authority schools, primary or secondary, than among students of other faculties; and fewer medical students were receiving financial assistance. The percentage of manual workers among the parents of medical students is low (16–20%), compared with the parents of science students (33–35%). The chance of admission to the medical course in 1955 can be inferred from table I of the report, which gives the required increase in places for admission of all applicants in medicine as 48%; in other words, 2 out of every 3 applicants were placed at the time and university of their choice. This is probably a reasonable figure, for many of the rejected applicants were placed in the following year, or were on the other hand lacking in the minimum requirements for entry. It would appear, in fact, that the medical schools are not at present compelled to turn away too many of their applicants, while on the other hand there is still a need and an opportunity for selection. The pressure for entry (and perhaps for expansion) can be expected to increase after 1960; but the number of applicants cannot be the sole criterion of the number of entrants. The staffing and accommodation of medical schools in general is scarcely adequate for our present numbers. This can no doubt be improved, but the process is unlikely to be sudden in its accomplishment or effects. Moreover, while we now have a better answer than ever before to the question "How many intending students are we likely to get?", we still have precious little solid information on the other end of the course—

1. Report on an Inquiry into Applications for Admission to Universities. By R. K. KELSALL. London: Association of Universities of the British Commonwealth, 36, Gordon Square, W.C.1. 17s. 6d.
2. *Times*, June 14.
3. *Manchester Guardian*, June 14.

"How many doctors do we need?" For that, we hopefully await the report of the Willink committee, set up in 1955 "to consider the future numbers of medical practitioners and medical students."

Night Vision

IN peace-time the city-dweller has very little occasion to use his night vision and (as was revealed in the first few nights of the blackout in the late war) may suffer from some degree of night blindness without ordinarily being aware of the fact. In the 1914–18 war poor night vision was apparently not a serious problem for the Allies, but it caused a good deal of anxiety in the armies of the Central Powers. In the 1939–45 war the demands on night vision made by the rigid blackout and by night flying brought the problems of seeing in the dark into sharp prominence, and much work has since been devoted to the subject.

When, in the years between the wars, the association between poor dark adaptation and vitamin-A deficiency was finally established, tremendous interest in night vision and the means of testing it suddenly developed. Much work was done on dark adaptation and night vision in an attempt to find some satisfactory means of evaluating the extent of possible vitamin-A deficiency in various populations. Unfortunately, by far the greater part of this work was unsatisfactory, owing to the incursion of workers from other specialties into the highly complex field of visual research. Consequently a number of workers, notably in America, Denmark, and this country, concluded that large sections of the population had some degree of vitamin-A deficiency—a conclusion that was not supported by other workers [1] whose investigations were more carefully controlled. One among the many causes of confusion was the uncritical use of two different criteria of dark adaptation. One of these is the sensitivity of the eye to light as such—in other words, the ability to recognise whether a test patch is illuminated or not—while the other is visual acuity at very low illuminations. More recent investigations [2] have revealed no correlation between the results obtained by these two methods; and the impression has gained ground that to estimate visual ability for some specific task it is necessary to devise a test bearing the closest possible similarity to the anticipated field conditions. If correct, this means that there can be no one generally satisfactory test for night vision.

The Medical Research Council has now published the report [3] of an extensive investigation of night vision in young subjects. Both the absolute sensitivity to light and the visual acuity at low illumination were tested in the same people. A carefully checked and rigidly controlled method of measuring the dark adaptation and the absolute sensitivity was found to be relatively simple in operation, but some training was necessary before reproducible results could be obtained with two very different visual-acuity tests. After such training, however, there was a high correlation between the performances on these tests and those on the simple sensitivity test. But this correlation held only for visual acuity at scotopic levels; at higher illuminations other factors complicate the picture. The authors of the report therefore claim that a carefully devised sensitivity test can be used as a measure of night vision, or at least of potentiality for performing visual tasks at low illuminations after suitable training. Their discussion of the reasons why they were able to obtain a correlation between visual sensitivity and what they call visual perception, whereas such careful and experienced workers as CRAIK and VERNON could not, is convincing.

Obviously performance in the field—for instance, on the bridge of a ship—cannot be accurately predicted from knowledge of the person's visual sensitivity in the laboratory; too many extra psychological and other factors are involved. As the authors themselves point out, a high visual sensitivity does not of itself ensure good perceptual efficiency. On the other hand, a good perceptual efficiency requires a high sensory efficiency, and the latter can be measured in the laboratory. It seems, therefore, that tests such as those described could at least be useful in picking out candidates with poor sensitivity who will always be unsuitable for exacting visual tasks at low illuminations.

1. Ehlers, H. *Acta ophthal., Kbh.* 1937, **15**, 443. Groth-Petersen, E. *Acta med. scand.* 1938, **95**, 110. Palmer, C. E. *Amer. J. publ. Hlth*, 1938, **28**, 309.
2. Berry, W. Review of Wartime Studies of Dark Adaptation, Night Vision and Related Topics, Armed Forces National Research Council Visual Committee Secretariat, University of Michigan, Ann Arbor, 1949. Craik, K. J. W., Vernon, M. D. *Brit. J. Psychol.* 1942, **32**, 206.
3. Pirenne, M. H., Marriott, F. H. C., O'Doherty, E. F. Individual Differences in Night-vision Efficiency. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1957, no. 294. H.M. Stationery Office. Pp. 83. 8s.

Serum-cholesterol and Myocardial Infarction

SEVERAL recent studies have added precision to our knowledge of the levels of cholesterol in apparently healthy men and women living in various countries. In general, these studies have confirmed earlier views that myocardial infarction is often associated with high levels of serum-cholesterol, but they have added little to the understanding of the association between coronary-artery disease and disturbance of lipid transport in the blood.

LAWRY et al.,[1] in Boston, investigated 1508 men and 412 women, of whom most were resident in New England but a minority came from New York, Chicago, and other parts of the United States. All were active and well by certain pre-determined criteria. Blood from 273 men who had had myocardial infarction and 141 men with definite angina pectoris was also examined. In addition to serum-cholesterol the serum S_f 12–20 and S_f 20–100 lipoproteins were estimated by flotation methods. LAWRY et al. remark on the wide range of serum-lipid values in large groups of people of the same sex and age and with similar health status. Individual values are thus of limited interest, but much can be learnt from mean values for groups. For men the mean serum-cholesterol value at age 25–29 was 212 mg. per 100 ml. Thereafter the value rose steadily to a maximum value of 245 mg. spread over the years from 45 to 59. After 60 there was a slight fall. The mean values for women were about 20 mg. lower than those for men up to the age of 45. Thereafter the means for women

1. Lawry, E. Y., Mann, G. V., Peterson, A., Wysocki, A. P., O'Connell, R., Stare, F. J. *Amer. J. Med.* 1957, **22**, 605.

continued to rise, and for the age-group 60–69 the mean was 263 mg. For men aged 30–39 with acute myocardial infarction the mean level was 301 mg.—74 mg. above the mean for the healthy group of the same age. As age advanced, mean levels in the patients fell: the difference between the means of the patients and the healthy subjects diminished and was only 18 mg. at 50–59 years. The means for patients with angina pectoris were only slightly above the normal values. Only in patients with myocardial infarction who were younger than 40 were the mean figures very much higher than those for the controls. Tables show that after a myocardial infarction many older men have a serum-cholesterol value no higher than the mean for the control group. A smaller study in Malmö, Sweden, gave very similar results.[2] Apparently healthy Swedes have slightly lower values than the Americans, with a maximum of 230 mg. per 100 ml. in the age-group 50–59. Patients with myocardial infarction have a much higher serum-cholesterol than the control group up to the age of 50, but between 50 and 59 the difference is only just over 10 mg. In a large study in New York [3] the sera of 1200 apparently healthy men and women were examined. The cholesterol levels for the men were very similar to those in the Boston series, with the mean reaching a maximum of 247 mg. per 100 ml. at the age of 40. In the New York series girls up to the age of 20 have higher levels than boys; then up to 45 years the figures for men are higher; but after the menopause the figures for women continue to rise, with a maximum of 260 mg. at 60 years.

The Boston group point out that, although all these figures have been obtained on apparently healthy people, they do not necessarily represent normality, for myocardial infarction is endemic in the United States, as it is in Sweden. They add that a strong argument can be developed for the contention that the normal serum-cholesterol level in men is 150 mg. per 100 ml. This view is supported by a study in Israel, by Dr. TOOR and his colleagues, which appears on an earlier page of this issue. These workers show that, in recent immigrants to Israel from the Yemen, mean serum-cholesterol levels for men vary from 145 to 158 mg.; in women after the menopause a maximum of 190 mg. is reached. In Yemenite immigrants who have lived twenty years in Israel, levels are much higher and the means for men have a maximum of 210 mg. in the 55–64 age-group. These early immigrants lead a life which resembles more closely that of the U.S.A. and Western Europe; they also have a high mortality from myocardial infarction. The recent immigrants, who are poor Asiatic peasants, have a very low death-rate from this cause. In a letter this week Dr. BRUNNER and Dr. LÖBL also report low levels of serum-cholesterol in Yemenite immigrants to Israel, whereas Jews whose ancestors had lived for many years in Europe, the United States, or South Africa and were habituated to the manner of life in these countries had much higher levels (mean at age 46 years 231 mg. per 100 ml.)—the same as those usually found in their country of origin.

2. Björck, G., Blomqvist, G., Sievers, J. *Acta med. scand.* 1957, **156**, 493.
3. Adlersberg, D., Schaefer, L. E., Steinberg, A. G., Chun-I Wang. *J. Amer. med. Ass.* 1956, **162**, 619.

The Boston group found that neither S_f 12–20 nor S_f 20–100 values had any clear superiority over cholesterol values in predicting manifestations of coronary heart-disease. Nor could any useful combination of the three values be found. They also found that in over-weight people the contribution of "body fatness" to lipidæmia was significant; but the magnitude of the contribution was small, and they conclude that it can scarcely be of more than minor significance in the overall regulation of serum-lipids.

These observations on serum-cholesterol levels come from well-planned surveys in different parts of the world. Each is consistent with the hypothesis that the level of blood-lipids in man is artificially raised in successful modern civilisations. This disturbance of the lipid transport system appears to be an essential condition for myocardial infarction to become endemic in a people. Clearly the disturbance does not cause infarction, but only predisposes to it; the immediate causes of infarction remain unknown. But these observations provide firm evidence that the many studies now being carried out to determine the effects of different dietary fats on levels of serum-cholesterol are relevant to the prevention of myocardial infarction.

Annotations

BREATHING EXERCISES

IF owning that we do not know is the beginning of knowledge, then such a beginning was evident at a meeting of the section of physical medicine of the Royal Society of Medicine on June 12. Whether the benefits of breathing exercises are due to the exercises themselves or to the encouragement and attention that goes with them is disputed, and no acceptable controlled trial has been published. It is hard to get homogeneous material in so variable a disease as emphysema, and a double-blind trial of exercises is impossible. Dr. A. C. Dornhorst proposed the use of such objective measurements as vital capacity, tests of ventilatory capacity, and timed vital capacity. He said that patients with emphysema should start deep breathing when they expected exercise and dyspnœa. Dr. J. L. Livingstone, a firm believer in breathing exercises, reported many cases in which cure of asthma had followed a course of exercises, and thought that teaching patients to use the lower chest and epigastrium improved their condition and, especially in children, helped to prevent deformity. Dr. D. A. Brewerton was less impressed with the value of such exercises; he emphasised that breathing exercises were of little use for patients before abdominal operations, but that postural drainage was valuable after inhalation of isoprenaline.

Many speakers agreed that there was little or no change in objective measurements after a course of exercises; that advice was more important than exercises; that harder and consciously prolonged expiration, and slower breathing, were often helpful (especially in asthma, where they might abort an attack); and that singers could hold a note longer after training. There was less agreement about the possibility of diaphragmatic spasm or of learning to use any group of intrinsic respiratory muscles in isolation.

We can be sure that, by means of physiotherapy, many patients achieve better posture and coördination, are encouraged through feeling that something is being done, and learn when to breathe out and when to breathe deeply. But we remain ignorant of whether breathing exercises as such are helpful.

THE ELECTROCARDIOGRAM IN MITRAL-VALVE DISEASE

THE electrocardiogram in disease of the mitral valve reflects the effects of the lesion primarily on the left atrium, and secondarily on the right ventricle (in pure or dominant stenosis) or the left ventricle (in dominant incompetence). Appreciable left atrial enlargement and hypertension is reflected in the character of the P wave, which is widened and notched but of normal amplitude.[1] This widening and notching is present in most severe cases of mitral stenosis in sinus rhythm, but not in slight cases.[2] When pulmonary hypertension is present, the P wave may become augmented in amplitude, reflecting right atrial hypertension, and enlargement of both atria may be revealed by a tall, broadened, and notched P wave. Persistent atrial fibrillation, however, is present in roughly 45% of all cases of mitral-valve disease.[3]

Since mitral stenosis is one of the commonest causes of right ventricular hypertrophy in acquired heart-disease, the cardiogram often shows evidence of this.[3] The pulmonary arterial pressure and arteriolar resistance has been shown to be related to the left atrial pressure,[4] and to the severity of the mitral stenosis.[5] It might be supposed, therefore, that the degree of right ventricular hypertrophy apparent in the cardiogram would be a good guide to the severity of the mitral stenosis. Wood [2] noted that the degree of right ventricular hypertrophy was correlated closely with the height of the pulmonary arteriolar resistance, while Goodwin et al.[5] found poor agreement between the degree of right ventricular dominance on the one hand and the size of the mitral valve or degree of pulmonary hypertension on the other; but Wood and Goodwin agreed that severe right ventricular dominance indicated a high pulmonary-arterial pressure and resistance and a small mitral valve. The association of augmented, pointed P waves without proportionate evidence of right ventricular dominance should suggest the possibility of associated tricuspid stenosis.[6]

The difference in the findings in the two series of cases may be explained by several factors. The electrocardiographic assessment of the severity of right ventricular dominance is difficult. The degree of pulmonary hypertension was measured by cardiac catheterisation in Wood's cases, but for the great part it was assessed radiologically in those of Goodwin et al. Moreover, associated left ventricular hypertrophy may modify the picture [7]; Goodwin et al. claimed that some patients with critically stenosed valves had no evidence of any right ventricular hypertrophy, and only a third of these had any left ventricular hypertrophy.

Extreme right ventricular dominance is associated with tall delayed R waves, sometimes preceded by Q waves and followed by inverted T waves, in right precordial leads, and deep S waves in left precordial leads. These findings are common in congenital heart-disease, such as pulmonary stenosis, but rare in acquired right ventricular hypertrophy, including that accompanying mitral stenosis.[8] Morris and Whitaker [9] reported 9 such cases in 173 patients with mitral stenosis; and Pruitt and Robinson [10] found 41 cases in 93 patients with severe mitral stenosis, and 53 of extreme right ventricular dominance among 147 patients with mitral-valve disease of all types.

The evidence therefore suggests that critical mitral stenosis (if not severe pulmonary arterial hypertension) can exist without a corresponding degree of right ventricular dominance on the cardiogram. The presence of gross right ventricular dominance in mitral-valve disease virtually guarantees severe pulmonary arterial hypertension, but does not exclude mitral incompetence associated with stenosis.[5] When there is cardiographic evidence of abnormal left ventricular dominance, pure mitral stenosis cannot be the sole lesion, and dominant mitral-incompetence, aortic-valve disease, or severe systemic hypertension is likely.

TUBULAR DYSFUNCTION IN NEPHROSIS

RENAL biopsy in the nephrotic syndrome has shown that among the common renal lesions are subacute glomerular nephritis (membranous or proliferative), chronic glomerular nephritis, diabetic glomerulosclerosis, lupus nephritis (in systemic lupus erythematosus), thrombosis of the renal vein, and renal amyloidosis.[1] But of 56 cases investigated in this way, 6 are described as "nephrotic syndrome with predominant tubular degeneration." [1] This is interesting because it has become widely accepted that in the nephrotic syndrome the primary lesion is glomerular, causing increased filtration of protein, and that the heavy proteinuria is only partly or else not at all due to defective tubular reabsorption. Such histological changes as are present in the proximal tubular epithelium are related by some to maximal protein reabsorption; and simple tests, such as measurement of specific-gravity range or *p*-aminohippurate excretion, show normal tubular function in most cases.

The primary importance of a glomerular lesion in nephrosis has now been challenged, however, by Freeman and Joekes,[2] who believe that there is "diminished tubular protein reabsorption, without necessarily any abnormal escape of protein through the glomeruli." By means of paper electrophoresis they studied the differential protein patterns in serum, urine, and œdema fluid of 6 nephrotic patients. The patterns were very similar in urine and œdema fluid, which both showed a much higher proportion of albumin to globulin than did the serum. Freeman and Joekes reason that the abnormal quantities of plasma-lipoprotein and the consequent increase in the molecular size of the globulins led to a preferential loss of albumin into the tissue-spaces and renal tubules. Normal or raised ratios of serum-albumin to tissue-fluid-albumin in these patients appeared to exclude an increased escape of albumin due to a generalised capillary lesion. These findings are of interest, but the argument put forward by Freeman and Joekes is by no means conclusive.

Stanbury and Macaulay,[3] who accept the glomerular lesion as primary, have recently discussed secondary renal tubular insufficiency in the nephrotic syndrome. Renal glycosuria and amino-aciduria, either singly or together, have been reported in nephrotic patients, and Tegelaers and Tiddens [4] have described a more complex combination of tubular defects in 2 nephrotic children in whom renal glycosuria and amino-aciduria, acidosis, hypokalæmia, and polyuria developed. The rather similar patient described by Stanbury and Macaulay was first seen at the age of 2 years with all the typical clinical and biochemical features of the nephrotic state and was treated with cortisone for a week, concentrated plasma infusions, low-salt and high-protein diet, and, for several months, cation-exchange resin ('Katonium'). The nephrotic state continued, but hypocalcæmic tetany developed when the patient was 4 years of age; and subsequently he was found to have renal glycosuria and amino-aciduria, which had not been present at the onset of his illness.

1. Wood, P. Diseases of the Heart and Circulation. London, 1950.
2. Wood, P. *Brit. med. J.* 1954, i, 1051, 1113.
3. Trounce, J. R. *Brit. Heart J.* 1952, **14**, 185.
4. Holling, H. E. *Brit. med. Bull.* 1952, **8**, 358.
5. Goodwin, J. F., Hunter, J. D., Cleland, W. P., Davies, L. G., Steiner, R. E. *Brit. med. J.* 1955, ii, 573.
6. Gibson, R., Wood, P. *Brit. Heart J.* 1955, **17**, 552.
7. Pagnoni, A., Goodwin, J. F. *Ibid*, 1952, **14**, 451.
8. Campbell, M. *Ibid*, p. 204.
9. Morris, T. L., Whitaker, W. *Amer. Heart J.* 1956, **52**, 738.
10. Pruitt, R. D., Robinson, J. G. *Ibid*, p. 880.

1. Kark, R. M. Cited by Findley, T. *Amer. Heart J.* 1957, **53**, 323.
2. Freeman, T., Joekes, A. M. *Acta med. scand.* 1957, **157**, 43.
3. Stanbury, S. W., Macaulay, D. *Quart. J. Med.* 1957, **26**, 7.
4. Tegelaers, W. H., Tiddens, H. W. *Helv. pædiat. Acta*, 1955, **10**, 269.

Next he had a frank hypokalæmic episode, with muscle weakness and confusion. Hypokalæmia had been detected biochemically, but had been disregarded, shortly after administration of cation-exchange resin had been discontinued. At the age of 5 the child was dwarfed and showed delay in the appearance of centres of ossification and osteoporosis, probably due to extreme protein depletion and inadequate intestinal absorption of calcium; he still had heavy proteinuria and hypoproteinæmia; polyuria, glycosuria, amino-aciduria, potassium deficiency, and metabolic acidosis were present and were ascribed to defects of renal tubular reabsorption. These tubular defects might have been due to persistence of severe tubular degeneration, such as is known to occur in acute membranous glomerular nephritis. An alternative suggestion by Stanbury and Macaulay is that the cation-exchange resin brought about potassium deficiency and tubular kaliopenic nephropathy with possible irreversible damage. However it was produced, the combination of tubular defects in this patient is reminiscent of that in cystine-storage disease (Lignac-Fanconi disease) and in a varied set of tubular nephropathies generally grouped under the unsatisfactory title of "adult Fanconi syndrome." Obviously, renal tubular deficiencies can arise singly or in many combinations and may be due to congenital defect of tubular structure or function or to a wide variety of acquired diseases, among which we may now have to include the nephrotic syndrome, or, possibly kaliopenic nephropathy resulting from its treatment.

THIOBARBITURATES IN ANÆSTHESIA

THE synthesis of the thiobarbiturates was described in 1935,[1] and a year later the first reports of the clinical use of one of them, thiopentone, began to appear. Since then, thiopentone has remained the most popular intravenous anæsthetic. But knowledge of its side-effects and of its mode of breakdown in the body has led to the introduction of other thiobarbiturates, and more recently of other drugs.

The principal side-effects are depression of respiration and circulation, and increased liability in some patients to coughing and laryngeal spasm. The relatively brief anæsthetic action of thiopentone was early claimed as a major advantage, but by modern standards it is too long in certain circumstances. Moreover the speedy return of consciousness that follows its use is due, not to quick detoxication, but to a rapid redistribution of the drug in the body. Thus for about 30 hours after an induction dose of thiopentone, enough of the drug remains in the body to affect the duration of action of a subsequent dose.[2] Too large an initial dose prolongs unconsciousness; even a small dose leaves the patient unfit for responsible action for some hours (though he may not be aware of it himself), and repetitive doses are cumulative.

Other thiobarbiturates were first introduced primarily to circumvent the side-effects. Clinical reports appeared in 1946 of thialbarbitone ('Kemithal'), synthesised in 1938, and in 1950 of thiamylal ('Surital'), one of the original thiobarbiturates. Neither of these drugs is sufficiently different from thiopentone to have achieved widespread use as an alternative.

Interest in recent years has been concentrated on duration of action rather than on side-effects, and two other thiobarbiturates have achieved some prominence. One—methitural sodium ('Neraval,' 'Thiogenal')—seems to differ little from thiopentone.[3] Favourable reports on the other—buthalitone sodium ('Transithal,' 'Ulbreval,' 'Baytinal')—have appeared in this country, and a much briefer effect than that of equipotent doses of thiopentone has been claimed for it.[4] But clinical assessment of the duration of effect of these anæsthetics is difficult, and more objective measurement by means of the electro-encephalogram suggests that buthalitone may in fact be active for even longer than thiopentone, though the difference between the two is slight.[5]

The best hope of better intravenous anæsthetics may lie in investigation of drugs other than thiobarbiturates. Hydroxydione ('Viadril'), a steroid with anæsthetic potency, has some advantages,[6] and a new substance—5-ethyl-6-phenyl-meta-thiazone-2,4-dione ('Dolitrone')—has been synthesised and used clinically for intravenous anæsthesia, but without striking advantages.[7]

PELVIC TUBERCULOSIS

CHEMOTHERAPY has transformed the prospects for women with tuberculous infection of the genital tract. This is not a common disorder, but the increasing investigation of women with minor gynæcological disturbances is revealing an unexpectedly large proportion of cases of pelvic tuberculosis. A frequency of 5·3% has been found among nearly 2000 patients complaining of infertility, and this figure is regarded as a minimal estimate.[8] Other common presenting symptoms such as pain, abnormal uterine bleeding, amenorrhœa, and vaginal discharge have led to the discovery of this underlying disorder, often without any palpable abnormality in the pelvis. Pelvic tuberculosis must always be borne in mind as a potential cause of persistent gynæcological symptoms, especially when infertility coexists. Halbrecht[9] found that 40% of cases of blocked fallopian tubes (discovered on salpingography for primary sterility) were caused by tuberculosis. The diagnosis is usually made by histological study of the endometrium; the specimen should be obtained as late in the cycle as possible to give the slow-growing tuberculous focus as long as possible to develop. (Fewer cases of endometrial tuberculosis would be missed if routine curettage was more commonly timed for the premenstrual phase.)

Before the advent of chemotherapy it was perhaps of academic importance whether the early case was diagnosed, for treatment was restricted to general health measures, a sanatorium régime, or X-ray therapy to suppress ovarian activity and rest the genital tract.[10] The extent of the change that has taken place is indicated by the final report of the joint subcommittee of the British Tuberculosis Association and the Royal College of Obstetricians and Gynæcologists on the treatment of endometrial tuberculosis with streptomycin and *p*-aminosalicylic acid (P.A.S.).[11] This report analyses the results of a controlled trial in several centres in England and Scotland from 1950 to 1952, in which women with tuberculosis limited to the genital tract were allocated at random to a treated or an untreated group and followed up according to a prearranged schedule. The treated patients received a three-month course of streptomycin (calcium chloride complex) 1 g. and P.A.S. 12 g. daily as outpatients.

Of 43 treated patients who were observed for a year from the start of treatment, only 5 showed bacteriological evidence of recurrence, whereas of 44 untreated cases 11 had to be removed from the trial because of clinical deterioration and given immediate treatment, and 25 of the remaining 33 still had evidence of tuberculosis at the end of a year.

Unfortunately, after treatment infertility usually persists.[9] By the time the diagnosis is made, the tubal epithelium has already been damaged, and successful

1. Tabern, D. L., Volwiler, E. H. *J. Amer. chem. Soc.* 1935, **57**, 1961.
2. Dundee, J. W. *Anæsthesia*, 1955, **10**, 139.
3. O'Herlihy, D. B., Nishimura, N., Little, D. M., Tovell, R. M. *Canad. anesth. Soc. J.* 1956, **3**, 326.
4. Nobes, P. *Lancet*, 1955, **i**, 797.
5. O'Mullane, E. J. *Brit. J. Anæsth.* 1957, **24**, 71.
6. Galley, A. H., Rooms, M. *Lancet*, 1956, **i**, 990. See *Ibid*, p. 1002.
7. Tait, C. A., Davis, D. A., Grosskreutz, D. C., Boniface, K. J. *Anesthesiology*, 1956, **17**, 536.
8. Sharman, A. *Brit. med. J.* 1947, **ii**, 83.
9. Halbrecht, I. *Fertil. Steril.* 1951, **2**, 267.
10. Jameson, E. M. Gynæcological and Obstetric Tuberculosis. London, 1935.
11. Sutherland, A. M. *Tubercle, Lond.* 1957, **38**, 46.

pregnancy is all too rare.[12] At present relief of infertility depends chiefly on prompt diagnosis and treatment. Further studies are in progress to determine what combination of drugs gives the best results, and to probe deeper into the all-important time factor. Comparison with practice in pulmonary tuberculosis suggests that longer courses of treatment may still further reduce the incidence of recurrence, and that P.A.S. and isoniazid by mouth are less likely to have serious side-effects or to cause the patient to default.

Possibly in the future irreparable tubal fibrosis may be prevented by combining chemotherapy with cortisone or allied substances.

QUARANTINE IN POLIOMYELITIS

THOUGH poliomyelitis is classed among the highly infectious diseases, secondary cases among family contacts are relatively uncommon. In a statistical survey in this country, Spicer and McDonald,[13] using data obtained in the Medical Research Council's investigation of inoculation and paralysis, found that among 7782 households in which there was a primary case of paralytic poliomyelitis, in only 82 did another paralytic case follow. They suggest that, as far as home contacts are concerned, quarantine and passive immunisation with gamma-globulin have little value. One course often followed in this country is to confine close child contacts to house-and-garden quarantine for three weeks from the date of last possible exposure to infection, and to exclude *all* family contacts from school. Only in exceptional circumstances are adults kept away from work.[14] The W.H.O. expert committee on poliomyelitis [15] recommended that "children with familial or intimate exposure should be confined to their homes for 21 days. Adults need not be confined . . . they should refrain from association with children other than their own and should avoid intimate contact with adults."

Strict quarantine measures, even if desirable, are not always practicable: they need much organisation and take up a great deal of the public-health department's time. To be successful, they depend on the support of the public, and therefore on effective publicity and propaganda. In a thickly populated area the task may be almost impossible; for one thing, interference with the work of the community may not justify the results achieved. In a small isolated community, on the other hand, quarantine may be feasible and effective in stopping an outbreak[14]; though Goffe and Parfitt[16] were not persuaded that quarantine measures did anything to stop community infection in the small winter outbreak they studied. Agerholm,[17] however, was convinced of the value of quarantine: she maintained [18] that the persistence of virus in the fæces was less important than many people supposed; and she believed that the real danger lay in pharyngeal carriage, which lasted for a much shorter period and would therefore be more susceptible to control by quarantine. But not everyone is yet prepared to relegate the fæcal carrier to comparative insignificance.

Further data about the influence of quarantine are therefore welcome, and the organisation and results of strict house quarantine in a housing-estate in an isolated valley near Brighton have lately been described by Parker.[19] Such elaborate measures had not been taken in the borough before, because, as is usual (and extremely likely in a town with a large floating population), the number of sporadic apparently unrelated cases did not seem to justify more than routine action. But when 5 cases of paralytic poliomyelitis were notified in a week among children living on the estate, which had been free from the disease for at least five years, it was decided to impose house-and-garden segregation on everyone in the affected families. This rule was relaxed only to allow the housewife to go shopping once a day, and she was instructed to wash her hands immediately before she went out. Only 3 new cases were diagnosed on the estate later than twelve days after the diagnosis of the first case and four days after strict quarantine was begun. 2 of these 3 cases were from houses already in quarantine. In Brighton itself, however, sporadic cases continued to appear for more than two months. There is no proof that quarantine protected the housing-estate from further attack, but the results are, to say the least, interesting.

Public coöperation in the quarantine measures was sought in various ways. A team was formed from members of the child-welfare and school-health services who were already familiar to those living on the estate. The head teacher of the school "at once assumed the position of leader of the local population," and the school became the operational centre. Public meetings were addressed by the medical officer of health, and the local press passed on information and advice.[20] Those in charge appreciated that success depended on full public support. It is noteworthy that, as a result of the crisis, barriers were broken down and a good community spirit sprang up where little had existed before.

Experiments of this kind should be repeated elsewhere when conditions are favourable, and much valuable information could be gained by carrying out at the same time virus examination and antibody surveys in contacts and others. (We refer on p. 1305 to some preliminary details from a London borough where the fæces of contacts of a case of poliomyelitis have recently been examined.) Good opportunities for such inquiries may present themselves in the next few weeks: next year the picture may have been complicated by the immunisation of large numbers of children.

BIRTHDAY HONOURS

THE barony accorded to Sir Horace Evans in the Birthday Honours list will give pleasure to the many colleagues who have observed his lightly borne wisdom in consultation and his cheering friendliness to all patients from king to commoner. Mr. Ralph Marnham, surgeon to St. George's Hospital, London, is appointed K.C.V.O. for services to the Royal house. Major-General F. K. Norris, who is appointed K.B.E., is well known in Australia and beyond for his service in the Army, ranging from combatant duties in the 1914–18 war to the post of director-general of medical services in 1948–55, and for many other useful activities. Australia will also welcome the knighthood granted to Prof. A. B. P. Amies, dean of the faculty of dental science in Melbourne, who became known to a wider circle in the Western Desert in the late war. Other doctors in the Commonwealth who are honoured include Mr. J. H. Pierre, who has pioneered chest surgery in the West Indies, and who is now created a knight. In this country knighthood is to be conferred on Prof. G. R. Cameron, F.R.S., the author of distinguished work on cellular pathology; Dr. R. Brunel Hawes, who holds the important post of consulting physician to the Colonial Office at an exacting time; Prof. G. W. Pickering, who, at his translation last year from London to the regius chair in Oxford, was already esteemed as a professor of medicine and as a person; and Colonel M. Stoddart-Scott, M.P., and Mr. S. T. Irwin, M.P., Northern Ireland, who are honoured for political and public services. To these and others whose names appear on p. 1295 we offer our congratulations.

12. Halbrecht, I. *Lancet*, 1955, ii, 1165.
13. Spicer, C. C., McDonald, J. C. *Ibid*, March 2, 1957, p. 470.
14. Ministry of Health and Department of Health for Scotland. Medical Memorandum, Poliomyelitis, July, 1954. See *Lancet*, 1954, ii, 187.
15. *Tech. Rep. Wld Hlth Org.* 1954, no. 81, p. 24.
16. Goffe, A. P., Parfitt, E. M. *Lancet*, 1955, i, 1172.
17. Agerholm, M. *Ibid*, 1953, ii, 287.
18. Agerholm, M. *Ibid*, 1955, i, 1327.
19. Parker, W. S. *Med. Offr*, 1957, 97, 107.
20. Gorringe, V. P. *Ibid*, p. 109.

The Wider World

REFLECTIONS ON MEDICAL TRAVEL

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AIDED foreign travel, like the aeroplanes we travel in, is part of the post-war way of life. It goes with egalitarianism and new types of privilege, with high taxation and income-tax rebates, with notional half-days and study leave. It is a product of the past decade and the time has perhaps come to review its development.

How enjoyable was the first small international congress of internal medicine in Basle in 1946 and how sadly congresses have deteriorated since! Indeed, their initial success was largely due to the fact that they manifested a world set free, they satisfied a need, and they were spontaneous and improvised. Today, congresses are immense in size and they are organised down to the smallest item. There were 1500 hæmatologists at the last congress of the International Society of Hæmatology, which is a relatively small specialty, and the expenditure for the congress exceeded 100,000 dollars.[1] The attendance at symposia on some minute facet of medicine may be numbered in hundreds.

One thinks of the long period of gestation, the delay between the acceptance of a paper and its delivery, which means that the material is already out of date by the time it is given; the concessions to international susceptibilities in the choice of programme; the ageing stage-army of regular performers; the frequently deplorable level of presentation; the devitalised version of the addresses that comes over the Tannoy; the impossibility of discussion; the host of papers read by title so that participants can obtain currency allowances and tax reliefs; the inability to see one's friends unless one arranges a rendezvous beforehand; the banquets with the conventional references to the internationality of science; the expensive outings and the crowded sight-seeing—and one wonders sadly whether medicine, too, has not come under the sway of Admass.

Congresses have become too large and too frequent if their object is the advancement of medicine and the promotion of friendship among physicians. The cost per head rises steeply when the attendance exceeds a few hundred, and the organisers become preoccupied with the physical problems of the meetings, the organisation of entertainments and the collection of subventions from the pharmaceutical and other industries. However, the main subject of my paper is not these *omnium gatherums* but the growing stream of individuals who journey from our shores to all parts of the earth as visiting professors, lecturers, examiners, advisers, and so on. This, again, is a new phenomenon. Few, if any, of my teachers in Manchester and Cambridge, and few of my pre-war colleagues on the staffs of London hospitals, had ever visited one of the Dominions or Colonies in peace-time; and that indefatigable traveller, Sir Arthur Hurst, did not get farther than North America.

Whereas international medical conferences might well be diminished in size and frequency, I believe that the more solitary migrants have an increasingly important part to play in the development of medicine and in the enhancement of England's status in the comity of nations. Because aided travel is new, it is probably susceptible to technical improvement, and this must be my excuse for some notes on a term of absence in which I travelled around the world in 130 days. A little mathematics shows that the average velocity was over 200 miles a day and the circumspection therefore somewhat superficial. The journey is seen, however, against the background of previous trips to Europe and America.

* * *

The human brain, particularly at the age when visiting professors are selected, is not a high-speed camera; and impressions soon blur if they are received in too rapid succession. I believe a process of unconscious re-remembering has to go on for some time until an imprint on the brain is fully developed. This seems not to happen if the attention is closely focused on ever-changing scenes, and the traveller should remember Wordsworth's dictum that emotion must be recollected in tranquillity if it is to issue again in a communicable form. It is wise, therefore, to insist on a five-day week, with one week out of every five off all duties, including social duties. Moreover, it is foolish to travel round the world and to miss seeing the Barrier Reef, Alice Springs, Darjeeling, and the Khyber Pass. In retrospect, the journeys along the interminable corridors and stairs of so many departments of anatomy and pathology have faded into a grey cloud, whereas a sunny afternoon at the races in Sydney, or a dinner by candlelight at the club in Melbourne, remains indelibly fixed in the mind. "Not by eastern windows only, when daylight comes, comes in the light."

* * *

There are three types of academic foreign travel, the visit, the progress, and the sortie. They are not mutually exclusive and in this recent trip a visit and a progress were combined. The most profitable period, for others as well as myself, was the five weeks I spent in Sydney as McIlrath guest professor. There we stayed in one place—actually in the hospital—long enough to get to know well the staff, the students, and in particular the hospital residents. I was in charge of beds and took part in teaching, including the postgraduate fortnight, so that there was no need to collect special audiences, as sometimes has to be done for a visiting lecturer. I had the opportunity to go out to near by centres such as Canberra and Orange, to visit practitioners in their homes and cottage hospitals, and to become familiar with the general social and economic background.

The rest of our trip was what I have called a progress. Here, to change the metaphor, one starts on a conveyor belt under the ægis of a sponsoring organisation, and the belt moves inexorably along. Life is a succession of academic and social engagements and unrestful travel, and six weeks of this in Russia is said to destroy one's taste for caviare and champagne for the rest of one's life. If you have a queazy stomach your travel will be one long dyspepsia; and, if you have not, you will increase your chances of bronchial carcinoma and coronary thrombosis, which have taken a heavy toll of recent medical travellers. You are introduced as an expert in some small sector of medicine, and if you are a hæmatologist the same obscure cases of aplastic or hæmolytic anæmia, of lymphadenopathy, or leukæmia turn up wherever you go. A longer stay is necessary to convince people that you are interested in medicine as a whole.

The worst method of travel is the sortie, in which the holder of a travelling professorship, instead of taking long leave of absence; continues to look after his firm, his practice, or his department and makes brief dashes across the oceans like a water-beetle zigzagging across a pond. This indicates a misguided sense of personal indispensability. Any well-established department should be able to spin for some months like a humming-top without further application of the whip. It is true that the current quip has it that the part-time consultants are away part of the time and the whole-time consultants away the whole of the time. It is true, too, that some travellers return home to find that their subordinates have become dissident; but these are usually men like Richard I, for whom foreign excursions have become a

1. *Blood*, 1957, **12**, 96.

perpetual way of life. The ordinary man who cares for his personal work and therefore travels only at reasonable intervals is well advised to delegate his duties entirely and not try to fill two exhausting rôles at the same time.

Short visits do, of course, have their rewards; for one makes many friends and receives abundant hospitality. Centres which are often by-passed may be greatly stimulated by a visit and immensely grateful for the contact. While, therefore, it is bad for a single individual to make a journey which consists of short visits to many different places, it would be good to try to satisfy the desire for more contacts with English medicine by encouraging more people to interrupt the flight to Australia or the Far East and to touch down and lecture at one centre at least. A continuous flight to the Antipodes is exhausting if it is not interrupted by one or more breaks en route. Again, it would be better for a Sims professor to spend six weeks at two of the six capital cities in Australia rather than two weeks at each of them. Over the years it could be ensured that each capital city got a fair proportion of the professors.

* * *

A visit may be of any length, though anything more than the traditional sabbatical year would be unusual. What I have termed the progress, where the visitor is travelling more or less continuously, should probably not be less than three weeks, to justify the expense of the journey, nor more than three months, to maintain peak performance. In many people the return home is followed by a period of reactive depression which has been called the repatriation syndrome. Some of the components of this are fatigue, the accumulation of tasks and problems during absence, and the switching-off of the limelight in which the traveller has basked so happily.

* * *

A difficulty with a lecture tour through a variety of countries is the different character of the audiences which are encountered. The same lectures will not be suitable for all of them. With the growth of medical travel and writing, ideas travel quickly and modern audiences have become like the ancient Athenians who perpetually demanded some new thing. It is idle to pretend that any of us possesses a large stock of unpublished information, and the preparation of a great number of lectures summarising current knowledge is a wearisome task.

In the large centres in Australasia the doctors are right up to date and they complain that some recent visitors have talked down to them. They require something sophisticated, with an element of personal research. The men in the smaller centres in Australia are equally up to date, but they want something of a practical type which deals with the current problems of Western medicine. In India and the Far East the medical setting is quite different. It is important to note that the major problems are not those of tropical medicine in the accepted sense; in so far as they are, they can be left to experts in tropical medicine. Most of the clinical material is identical with what Osler saw and described in North America over seventy years ago; but it is on a vast scale, it has to be handled on a doctor-patient ratio of 1 to 10,000, and it is presented against the background of modern chemotherapy and modern ideas about public health. For example, all these Eastern countries are going through an epidemic of tuberculosis which is more severe than the one we experienced in Europe a hundred years ago, but today much more is known about the epidemiology and treatment of tuberculosis.

Other common illnesses are nephritis, rheumatic heart-disease, and rheumatoid arthritis; anæmia and leukæmia; jaundice, cirrhosis of the liver, and splenic anæmia; bronchitis, emphysema, and heart-failure; typhoid and the dysenteries. Some diseases which are important in this country, such as pernicious anæmia, ulcerative colitis, and disseminated sclerosis, are almost completely absent, and there is little interest in geriatrics when half the population is under the age of 21. There are, of course, regional differences, lung cancer and peptic ulcer being common in Burma but uncommon in North India and Pakistan.

The problem in the East is to smash these great epidemics of disease and to discover the best way of doing this with limited man-power and funds. Expensive individual procedures—what I call millionaire medicine—are of much less practical importance than community programmes, and therefore lectures on field work, screening for disease by simple tests and therapeutic trials, should be successful, even though British experience is not immediately transferable. This is not to say, of course, that the physician in the East does not enjoy the occasional purely scientific lecture as much as the physician in the West and there is always interest in material which can be presented dramatically or visually, such as plastic surgery, cardiac surgery, and thoracic surgery.

(To be concluded)

Occasional Survey

THE ARCHITECTURAL FUNCTION OF PULMONARY CAPILLARIES

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RESEARCH has suddenly advanced our knowledge of the initial expansion of human lung. The idea that the lungs first expand gradually over hours or days was never held by Potter,[1] who showed that inflation with either air or oxygen caused irregular expansion, with distension of the proximal parts of the lung and atelectasis of the distal parts. She also showed that this histological appearance in the mature neonate proved that an attempt had been made at resuscitation by inflation. In premature neonates weighing 1000–2000 g. Potter found the same appearance produced by the infants' own respiratory efforts. Lind and Wegelius,[2] in their exquisite ciné-radiological studies, show how quickly the lungs expand in normal neonates: with the first two or three breaths the lungs expand "like the lighting of a lamp," and the heart, which is initially large, diminishes stepwise with each respiration.

Jäykkä [3] has shown that the extirpated lungs of full-term neonates cannot be fully expanded by the air-pressure difference resulting from a negative pressure of −20 cm. of water applied outside the lung in a partially exhausted jar and a positive pressure of + 20 cm. of water applied within the trachea. This experiment produces a histological appearance similar to that shown by Potter [1] to be typical of the lungs of mature neonates in whom inflation by air or by oxygen had been tried as a means of resuscitation.

More important is Jäykkä's finding that when a fluid pressure of 80 mm. Hg is put into the pulmonary artery in addition to the above-mentioned application of the air-pressure difference, the alveoli expand to their proper extent. He considers that the pulmonary capillaries are erectile and help to hold out alveoli as a result of their distension with blood. His inability to expand the lungs of fœtuses weighing 500–800 g. by this method

1. Potter, E. L. Pathology of the Fetus and the Newborn. Chicago, 1952.
2. Lind, J., Wegelius, C. *Int. Cong. Pædiat.* 1956.
3. Jäykkä, S. *Acta pædiat., Stockh.* 1957, **46**, suppl. 112.

he explains on the grounds of immaturity of this erectile capillary system.

Dawes et al.[4] and Born et al.[5] have shown in lambs that, before the lungs expand, the initial pulmonary vascular resistance is high and can be made higher by asphyxia produced by tying the cord before the onset of respiration. The fact that the pulmonary resistance can be varied by asphyxia implies an ability on the part of this vasculature, probably the arterioles, to contract and so to raise the resistance and to impede the onward flow of blood to the capillaries.

Bonham Carter et al.[6] seem to have shown that a high venous pressure, measured in the inferior vena cava, is beneficial to premature neonates with respiratory difficulty at or shortly after birth, and these workers suggest that this benefit is derived from a high cardiac output (stroke volume) dependent on a high venous pressure.

The foregoing work seems to show two things :

(1) Initially the alveoli are expanded by the erectile pulmonary capillaries and the air-pressure difference created by respiratory effort.

(2) Where the peripheral pulmonary vascular resistance is very high, probably made so by asphyxia, a high cardiac output is necessary to overcome it, so that the pulmonary capillaries may be adequately filled with blood and play their part in the proper expansion of the alveoli.

Gunther [7] shows how much the position of the placenta relative to the baby, and other factors, with the cord intact, can vary the neonatal blood volume—up to 47% of the expected total. She also shows how, with the cord intact, the baby acts as a plethysmograph, recording, by increases in weight, the effects of uterine contractions on the placenta during the third stage of labour. Sharpey-Schafer and Wallace [8] have shown, in adults, what a great volume of fluid is required to raise the systemic venous pressure by transfusion, and how fast it has to be injected, but Gunther's findings indicate a fast transfusion of a relatively great volume of blood during the third stage of labour under certain conditions.

From the visible evidence of Lind and Wegelius's film of the stepwise diminution in the size of the heart during the first two or three breaths and from Bonham Carter's work it looks as though the stroke volume of the heart during the onset of respiration is high, and that the capacity of the neonatal right auricle to withstand a high pressure must be great, for a caval pressure of 14 cm. of 5% dextrose solution in water has been recorded with survival. It seems likely also that the factors described by Gunther play a part in the production of this high stroke volume. Perhaps Starling's law is being exercised at the time almost at the maximal stretch of cardiac muscle.

The redirection of blood with the onset of respiration must be considered. A high right-auricular pressure must tend to keep open the foramen ovale because of its anatomical structure. Therefore, unless there is a high left-auricular pressure, the right-to-left shunt must persist. Could the initial distension of the heart seen in the radiographic film, and implied by Gunther's work, provide for this shunt and for adequate right ventricular filling ? Or must a sudden rise in left-auricular pressure be assumed ? If the left-auricular pressure rises thus, as well it may, as the result of the high right-auricular pressure and the foramen-ovale shunt, a " backward " distension of pulmonary capillaries may occur (see below).

Barcroft [9] showed that the closure of the ductus arteriosus in lambs was related to the onset of respiration, probably by a mechanism involving an increase in systemic oxygen tension. Lind [10] and Hultgren [11] have produced evidence that the duct can be reopened, in human neonates, by interference with respiration or by breathing low-tension oxygen. It looks as though the duct closes with normal oxygen tensions and reopens or remains open with anoxia. If the peripheral pulmonary vascular resistance is high, the pulmonary artery pressure will also be high, if the cardiac output is maintained. Asphyxia, if this produces the same effect in men as in lambs, will do this. However, the direction of the flow in patent ductus arteriosus will depend on the relative pressures in the systemic and pulmonary circuits ; if the flow is largely from pulmonary artery to aorta, the blood normally used to distend pulmonary capillaries will be diverted : conversely, if the flow is the other way, the erection of pulmonary capillaries will be assisted by the shunt from the aorta.

This conception of the architectural function of pulmonary capillaries and the part they play in the initial expansion of human lungs can be related to the clinical picture of neonates with difficulty in breathing—what Bound et al.[12] called " the pulmonary syndrome of the newborn." These infants at, or shortly after, birth make desperate respiratory efforts. They have episternal, lower costal, and even sternal recession, and yet achieve little or no ventilation. They are commonly premature and born by cæsarean section. The physiological explanation of this behaviour may be that of a premature infant rendered asphyxial by some accident of birth, with the result that the peripheral vascular resistance in his lungs rises with increasing asphyxia in a vicious spiral, until his cardiac output cannot overcome it ; so his alveoli are never properly expanded. Possibly this situation arises from, or is aggravated by, a blood volume diminished by the factors shown by Gunther and possibly by early tying of the cord.

To explain on this hypothesis the ability of neonates with pulmonary atresia or with severe pulmonary stenosis to expand their lungs is difficult, unless the ductus arteriosus temporarily remains patent with a shunt from aorta to pulmonary artery and possibly with minimal assistance from the bronchial arteries. Such infants, however, would remain anoxic and so might be expected to maintain the patency of the duct.

If this hypothesis is acceptable, and the structural function of the pulmonary capillaries is maintained in later life, other concepts may follow. Lung elasticity (rigidity), its ability to relax from the inspiratory phase, will in part be a function of pulmonary capillary pressure.

Taussig [13] has drawn attention to the fact that children with congenital heart-disease and large left-to-right shunts have large lungs, a bowed sternum, and a flat diaphragm, and this has been our constant observation in the congenital-heart clinic at Great Ormond Street. A large left-to-right shunt will result in overdistension of the pulmonary capillaries until or unless the peripheral vascular resistance increases sufficiently to reduce the blood-flow. This, in a manner of speaking, is the " forward " form of pulmonary capillary distension giving rise to an inability of the alveoli to relax completely. The measurement of residual air is impossible in little children, but we have found, by way of indirect evidence, a tendency in such cases without congestive

4. Dawes, G. S., Mott, J. C., Widdicombe, J. G., Wyatt, D. G. *J. Physiol.* 1953, **121**, 141.
5. Born, G. V. S., Dawes, G. S., Mott, J. C., Widdicombe, J. G. *Cold Spr. Harb. Symp. quant. Biol.* 1954, **19**, 102.
6. Bonham Carter, R. E., Bound, J. P., Smellie, J. M. *Lancet*, 1956, ii, 1320.
7. Gunther, M. *Ibid*, June 22, 1957, p. 1277.
8. Sharpey-Schafer, E. P., Wallace, J. *Brit. med. J.* 1942, ii, 304.
9. Barcroft, J. Researches of Prenatal Life. Oxford, 1946.
10. Lind, J. M. & R. Pediatric Research Conference. Ohio, 1955; p. 27.
11. Hultgren, H. N. *Ibid*, p. 53.
12. Bound, J., Butler, N. R., Spector, W. *Brit. med. J.* 1956, ii, 1191, 1260.
13. Taussig, H. B. Congenital Malformations of the Heart. London, 1947.

failure to retain carbon dioxide with a shift of blood pH to the acid side, as if the mixture of gases was imperfect (unpublished data).

Hellems et al.[14] and Lagerlof and Werkö [15] have shown how pulmonary capillary pressure reflects the pressure in the left auricle. So a "backward" form of overdistension of pulmonary capillaries could arise from changes in left-auricular pressure with similar effects on the alveoli. The clinical picture here is that of cardiac asthma with its expiratory wheeze. Christie and Meakins [16] and others since have shown that an increase in residual air is usual in patients with chronic congestive cardiac failure, and an inability of the alveoli fully to relax in expiration may be the cause.

Finally, it must be said, that although pressure, flow, and resistance in the pulmonary circuit are interrelated according to Ohm's law and will therefore affect the rigidity and flaccidity of the capillary network, the property which is most responsible for this will be the tension in the wall of the capillaries. This tension, as in a tyre, will be related not only to the pressure within the tube but also to the radius and diameter of the tube. Under static circumstances this relationship can be expressed thus:

$$\text{Tension} = \frac{\text{pressure} \times \text{radius}}{2}$$

So little of the original work on this subject is mine that I clearly owe a debt to all those whose writings I have read on this subject, and all the friends that I have bored with it, particularly John Bound, Mavis Gunther, and Jean Smellie of the Obstetric Hospital, U.C.H.

14. Hellems, H. K., Haynes, F. W., Glovely, J. F. *J. clin. Invest.* 1948, **27**, 540.
15. Lagerlof, M., Werkö, L. *Scand. J. clin. Lab. Invest.* 1949, **1**, 147.
16. Christie, R. V. Meakins, J. C. *J. clin. Invest.* 1934, **13**, 323.

Special Articles

AN ATTEMPT TO COUNTER "INSTITUTIONALISATION" IN CHRONIC SCHIZOPHRENIC PATIENTS *

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HABIT-TRAINING is now a recognised method of dealing with the chronic deteriorated patient in a mental hospital. As its name implies, it seeks to impose socially acceptable behaviour on the patient by a process of conditioning. But though the patient's behaviour improves, he remains "institutionalised" [1]; for the method is disciplinarian and does not sufficiently encourage the spontaneous development of social interaction and initiative. Our experience among these patients led us to consider how we could counter the automatic pattern produced by conventional habit-training programmes.

In 1955 and 1956 I was concerned with a male ward [2] and a female ward [3] of chronic deteriorated patients. By habit-training we were able to improve their behaviour and to open both wards within a year. Aggressive behaviour remained the greatest difficulty, but we noticed that at mixed parties of patients from both wards there were hardly any acts of aggression and that the spontaneity and interest of patients improved.

This observation prompted us to consider extending this social contact by creating a mixed unit for deteriorated patients. Our aims were roughly defined as investigation of the effect of community life on the behaviour and psychotic process of deteriorated schizophrenic patients, and the effect of this new therapeutic policy on the attitudes and beliefs of all the staff. By treating this as a pilot study, we hoped to get some idea of the difficulties which would arise when extending this mixing of the sexes to other parts of the hospital.

A Schizophrenic Community

At the outset we decided to make our intentions as widely known as possible to all grades of staff. The first plans were made in September, 1956, at meetings with ward and administrative nursing and medical staff. In general there was considerable enthusiasm among those directly concerned, but misgiving among those who distrusted the disturbance of the traditional dichotomy between male and female sections of both patients and staff. Others saw it as yet another innovation which would upset the comfortable equilibrium of institutional life. But after discussion it was eventually agreed to give the plan a trial. In November, 1956, 44 men and 43 women patients were transferred from their wards to two adjacent villas in the hospital grounds.

Patients

The criteria for selection of these patients were a diagnosis of schizophrenia, a history of treatment in a mental hospital for five years or more, and a maximum age of 50. Further details about them are given below:

	Men	*Women*
No. of patients	44	43
Average age	40·4 yr. (range 26–50)	37·4 yr. (range 20–50)
Average time in mental hospitals	14·3 yr. (range 5–37)	12·3 yr. (range 5–21)
No. of patients who have had:		
E.C.T.	39	43
Deep insulin	7	14
Leucotomy	7	17

All patients had been rated on the Fergus Falls behaviour-rating scale by at least two independent raters before they were moved. The senior ward staff had been with them for a year or more and knew them well.

Pattern of Care

The actual move was made with the minimum of disturbance. The villas are surrounded by a large railed garden, and for the first two weeks the gates were closed in case patients wandered away. Thereafter they were opened, and they have remained open ever since. The doors of the villas were opened from the start.

The mixing of patients was at first allowed to develop spontaneously. After four days a woman wandered into the male villa and was promptly handed a bucket and scrubbing-brush; she scrubbed the kitchen floor without protest, but has never done as well since. In the first week about a dozen men and women patients began to meet inside and outside the villas.

In the second week a more formal programme was started. From both sets of patients were drawn two groups of 12 each, under one nurse. The sister or charge-nurse was responsible for the remaining larger group, some of whom were better preserved ward-workers. We were obliged to accept these unsatisfactorily large groups because we had so few nurses. Nurses in charge of groups understood that they were expected to organise the social and working activities of their group as well as getting to know all the members. From the start it was made clear that rigid adherence to the programme was not expected—more important was the opportunity for mixing given by the programme.

Men and women share gardening work on most mornings, and an art class for half of each villa is supervised by the art master twice a week. A mixed "movement

* Based on a paper to the Surrey Inter-Hospital Psychiatric Association on Feb. 21, 1957.

1. Martin, D. V. *Lancet*, 1956, ii, 1133.
2. May, A. R. *Ibid*, 1956, i, 500.
3. Folkard, S. *Proc. R. Soc. Med.* 1956, **49**, 1030.

with music" class is held one evening a week, and a ward social, with dancing and games, on another evening. Both villas attend dances, concerts, and the cinema in the main hall. Men and women who prefer to do so may watch television in the male villa in the evenings.

If the weather is bad, there is always a group of men patients in the female villa and vice versa—where they are encouraged to share in simple occupational tasks.

About three weeks after the move, one of the men patients visited the female villa and stayed to lunch. He was well tolerated, and we decided to have mixed meals at separate tables. We started with lunch and extended this to tea; behaviour at meals is excellent and there is virtually no disturbance, in sharp contrast to conditions in the original women's ward.

Staff

The most fascinating and probably the most important aspect of all these developments has been the change in the attitude of the staff. I hold a meeting with the ward-staff once a week, and once a month we have a larger conference with the medical superintendent, matron, and representatives from the administrative and training staff. We keep a record of matters discussed at all these meetings, and they have developed into very lively affairs, with a refreshing lack of reserve. Perhaps the best commentary on their success, or at any rate on their entertainment value, is the fact that although they started as lunch-hour sessions from 1 P.M. till 1.45 P.M., we are now usually obliged to end them forcibly about 3 P.M.

The interaction between men and women staff, with mutual criticism, has changed our discussions out of all resemblance to the rather moribund meetings we used to hold on the separate male and female wards. These discussions have been essential. The gradual development of policy has been anything but smooth, and the unit has been the cynosure of the hospital as a whole. The smaller ward-staff meetings have been frankly therapeutic, and the attitudes expressed over the management of individual patients have been related to personal motivations, with a good deal of interpretation. It has been most instructive to correlate the level of ward tension with the personal satisfaction or anxiety of the nurses.

A major theme which has run through all these meetings has been the conviction of the female staff that the women patients are more active, more aggressive, and more difficult to manage than the apparently well-drilled or well-trained men; and the equally strong conviction of the male staff that the women are not properly managed by the female nurses. This is mainly because the men, who had followed a habit-training régime for at least two years longer than the women, will *work* much better, though they are less spontaneous at social functions; and because the women are, by and large, as putty in the hands of the male staff. But this rivalry seems to be gradually lessening.

Response of Patients

Ten weeks after the move all patients were again rated on the Fergus Falls scale. There was a strong positive correlation between these ratings and independent clinical assessments, but the scale is not precise enough to measure the more subtle alterations in social attitudes and group interaction which we have noticed.

Though there has been no deterioration in the behaviour ratings since the move, neither has there been any significant improvement. On the other hand, many patients have become more spontaneous in social situations, and disturbances in the ward have been noticeably reduced under the mixed régime. Only 5 women, and none of the men, now require regular electroconvulsion therapy. It has only been necessary to seclude 1 patient, a man who became disturbed by the presence of women patients and staff and eventually had to be transferred. He was the sole casualty among the men. 2 of the women patients had to be transferred, 1 because of persistent absconding, and 1 because she became disturbed and deluded as a result of the co-education.

The apathy which is the stigma of the institutionalised patient has almost disappeared. The increased mobility and spontaneity is shown by the growing ease with which patients can be encouraged to perform fairly responsible tasks. Most of the men can now be trusted to shave themselves, and many of the women can be sent on errands to the hospital shop. The general bearing of patients has improved, they move more flexibly and with more purpose, and they can manage with less supervision than before. Less time is spent on washing, dressing, and toileting. All but about half a dozen will now answer when spoken to. Some who were previously uninterested now speak of each other and the staff by name, and the isolating anonymity of ward life is partially dissolving.

Conclusion

The experience of our first three months supports the view that change of environment towards a more normal community can have a therapeutic effect on chronic schizophrenic patients and can do much to combat institutional behaviour.

The future development of this project depends on the staff, and therapeutic policy has now been directed to countering institutional attitudes in them; for only by some such reorientation can they (including the doctor) prevent the patient from sinking back once again into the amorphous mass of chronic schizophrenics.

I wish to acknowledge the encouragement of Dr. R. K. Freudenberg, physician-superintendent, and to record my thanks for the coöperation and support of the nurses engaged in this project.

BIRTHDAY HONOURS

THE list of honours published on June 13 contains the names of the following members of the medical profession:

Baron

Sir HORACE EVANS, G.C.V.O., M.D. Lond., F.R.C.P.
Physician to H.M. The Queen; physician to The London Hospital.

K.C.V.O.

RALPH MARNHAM, M.CHIR. Camb., F.R.C.S.

K.B.E.

Major-General FRANK KINGSLEY NORRIS, C.B., C.B.E., D.S.O., E.D., M.D. Melb.
For services to medicine.

Knights Bachelor

ARTHUR BARTON PILGRIM AMIES, C.M.G., D.D.SC. Melb., F.R.A.C.S., F.R.C.S.E.
Dean of the faculty of dental science, University of Melbourne.

GORDON ROY CAMERON, M.B., D.SC. Melb., F.R.C.P., F.R.S.
Professor of morbid anatomy in the University of London at University College Hospital Medical School.

RICHARD BRUNEL HAWES, C.M.G., M.B. Lond., F.R.C.P.
Consulting physician to the Colonial Office.

SAMUEL THOMPSON IRWIN, C.B.E., M.CH. Belf., F.R.C.S.E., M.P. Northern Ireland.
Consulting surgeon, Royal Victoria Hospital, Belfast; for political and public services.

GEORGE WHITE PICKERING, M.D. Camb., F.R.C.P.
Regius professor of medicine, University of Oxford.

JOSEPH HENRY PIERRE, M.B. Lond., F.R.C.S.E.
Specialist surgeon, General Hospital, Port of Spain, Trinidad.

Colonel MALCOLM STODDART-SCOTT, O.B.E., T.D., M.D. Leeds, M.P.
For political and public services.

C.B. (Military)

Surgeon Rear-Admiral DAVID DUNCAN, O.B.E., M.D. Aberd.

Major-General PHILIP FRANCIS PALMER, O.B.E., M.B. Dubl.

Surgeon Rear-Admiral ARNOLD ASHWORTH POMFRET, O.B.E., M.B. Manc.

C.M.G.

FREDERICK ROLAND GEORGE HEAF, M.D. Camb., F.R.C.P.
David Davies professor of tuberculosis, University of Wales; consultant in tuberculosis to the Colonial Office.

DAVID JAMES MASTERTON MACKENZIE, O.B.E., M.B. Edin.
Director of medical services, Northern Region, Nigeria.

C.B.E. (Military)

Air-Commodore JAMES HILL, M.B. Glasg., R.A.F.

C.B.E. (Civil)

ARCHIBALD SIMPSON ANDERSON, M.B. Melb., F.R.A.C.S.
Honorary consultant ophthalmic surgeon, Victorian Eye and Ear Hospital, Melbourne.

ALEXANDER KING BOWMAN, M.B. Glasg., F.R.F.P.S.
Senior administrative medical officer, Western Regional Hospital Board, Scotland.

DAVID PATON CUTHBERTSON, M.D., D.SC. Glasg.
Director, Rowett Research Institute, Bucksburn, Aberdeenshire.

BENJAMIN THOMAS EDYE, CH.M. Sydney, F.R.C.S.
Honorary consulting surgeon, Royal Prince Alfred Hospital, Sydney.

SYBIL GERTRUDE HORNER, M.B. Lond.
Senior Medical Inspector of Factories, designate, Ministry of Labour and National Service.

DONALD HUNTER, M.D. Lond., F.R.C.P.
Physician and director of the department for research in industrial medicine (Medical Research Council), London Hospital.

SAMUEL HORTON OLUWOLÉ JONES, O.B.E., M.B. Manc.
Director of medical services, Gambia.

EDMUND OLIVER LEWIS, M.A. Camb., D.SC. Lond., M.R.C.S.
Lord Chancellor's Medical Visitor in Lunacy.

ERNEST STEVEN MONTEIRO, M.D. Malaya, F.R.C.P.
Dean of the faculty of medicine and professor of clinical medicine, University of Malaya.

M.V.O. (4th Class)

Surgeon Commander PETER GEOFFREY BURGESS, B.M. Oxfd, R.N.

WILLIAM NEIL MACLAY, M.B.E., B.A. Camb., M.R.C.S.

O.B.E. (Military)

Squadron-Leader PETER HOWARD, M.B. Lond., R.A.F.

Surgeon Commander JAMES LEES, M.R.C.S., R.N.

Lieut.-Colonel ALEXANDER ROBERT TAYLOR LUNDIE, M.C., M.B. St. And., R.A.M.C.

Lieut.-Colonel WALTER WILLIAM MCLELLAN, R.A.A.M.C.

Lieut.-Colonel MAURICE IRVING SILVERTON, T.D., M.R.C.S., R.A.M.C., T.A.

Squadron-Leader ARTHUR JOHN WAINWRIGHT, M.B. Birm., R.A.F.

O.B.E. (Civil)

JOSEPH ANTOINE HERMANN ANDRE, M.B.E., M.R.C.S.
Deputy director of medical services, Mauritius.

THOMAS JAMES BIGGS, M.B. Sydney.
Senior physician, Mater Misericordiæ Hospital, Sydney.

HUMPHREY MALOMO SAMUEL BOARDMAN, L.R.C.P.E.
Assistant director of medical services, Sierra Leone.

ARCHIBALD TURNER MACLEOD BLAIR, M.B. N.Z.
A medical practitioner at the Queen Elizabeth Hospital, Roturua, New Zealand.

MABEL ALICE DOBBIN CRAWFORD, M.D. Dubl., F.R.C.S.I.
Medical officer, Ministry of Supply.

ALFRED JOHN CRAIG, M.D. Malta, F.R.C.S.
Professor of surgery, Royal University, Malta; senior surgeon, government hospitals.

MUTHIAH DORAISINGHAM, L.M.
Deputy permanent secretary to the Ministry of Health and deputy director of medical services, Singapore.

MARY KATHERINE DOROTHY DOUGLAS, M.B. Edin.
For political and public services in Fife.

JOHN RICHARD HERTSLET FULTON, M.B. N.Z., M.R.C.P.E.
Chairman of the Otago hospital board, Dunedin.

NOEL GERALD CARLETON GANE, F.R.C.S.E.
Consultant surgeon, Salisbury Hospital and Rhodesian Forces.

JOHN MARK, M.B.
Medical practitioner and surgeon, Tauranga, New Zealand.

OTTO MASTBAUM, M.D. Cologne.
Malaria medical officer, Swaziland medical service.

FREDERICK LUBOVIUS RICHARD, M.B. Glasg.
Commissioner, St. John Ambulance Brigade, Staffordshire.

THOMAS HAINES SIMS, M.B. Camb.
Senior medical officer, Ministry of Pensions and National Insurance.

ROBERT STEWART SLESSOR, M.B. Aberd.
Senior medical officer, Falkland Islands.

ARTHUR WESLY SUGUNARATNAM THEVATHASAN, M.R.C.P.
For public services in Singapore

WILLIAM WOOD, M.B. Durh.
Head of virus research unit, Glaxo Laboratories.

M.B.E. (Military)

Squadron-Leader IRWYN MORSE PERKINS, M.R.C.S., R.A.F.

M.B.E. (Civil)

FREDERICK ESIRI, M.R.C.S.
For medical services in the Western Region, Nigeria.

FRANK NEVILLE GRANNUM, E.D., M.B. Edin.
Lately senior medical officer of health, Barbados.

THOMAS PATRICK HOWKINS, M.R.C.S.
Divisional medical officer, southern region, British Railways.

IVAN SAJA KADAMA.
Medical officer, Uganda.

MANCHERSHA MANEKJI KUTAR, M.B. Bombay.
Assistant medical officer, Aden.

PETRO SOLOMON BLANDINA MUGANWA.
Medical Officer, Uganda.

VILIKESA RAMAQA
Senior assistant medical practitioner, medical department, Fiji.

Medicine and the Law

Dispensing Doctor Issues Prescriptions

THE Minister of Health is to withhold £1100 from the remuneration of a doctor because of a breach of the regulations.[1] It was alleged that, between June, 1955, and March, 1956, he had issued prescriptions to the value of £269 16*s.* 11*d.* to patients for whom he was receiving drug capitation fees. In some cases the names could not be traced as National Health Service patients; in others the names were indecipherable. Some of the forms had been issued by the doctor's partners. The Kent and Canterbury executive council had at first recommended that £500 be withheld, but on considering events before June, 1955, recommended withholding £1500. The Minister has decided on £1100. The doctor has accepted responsibility, but attributed the discrepancies to "muddle and not wilfulness."

1. *Times*, June 13.

Conferences

A TRUCE IN THE REMUNERATION DISPUTE

Special Representative Meeting of B.M.A.

A SPECIAL representative meeting of the British Medical Association decided on June 12 that the profession should give evidence to the Royal Commission and that a decision on withdrawal from the National Health Service should be deferred. Dr. SOLOMON WAND, chairman of the B.M.A. council, summed up the situation by saying that a truce had been declared—an armed truce. The profession's dispute with the Government remained unresolved and if it was not settled in a way that doctors could accept, then they must still be prepared to take vigorous action. The breathing space, Dr. Wand added, would give them an opportunity to strengthen finances and promote unity. The need was for reunification, not recrimination.

THE ROYAL COMMISSION

Early in the meeting, a representative suggested that everyone's minds were made up and that no arguments would change them. Nevertheless, Dr. G. S. R. LITTLE (Greenwich and Deptford) pleaded forcefully for non-coöperation with the Royal Commission. First thoughts, he declared, were best and the first thoughts of the council had been not to give evidence to the Commission. Whether the Spens reports were legally valid or not was unimportant. Spens was not, as had been suggested, "in the melting-pot": it was in the incinerator. Dr. Little was sure that the Royal Commission would produce something much less attractive than Spens. When the Commission had reported, the Government would accept only those recommendations which it was prepared to accept *now*.

Dr. C. P. WALLACE (Guildford) sadly reflected that, by reason of default, it had become inevitable to give evidence; and Dr. A. V. RUSSELL (Wolverhampton) thought that, though the profession would not get very far by going to the Commission, there was now no alternative. Mr. H. H. LANGSTON (Winchester) was for a more cheerful approach: "if we are to give evidence, do not let us do so in this lukewarm way." But Dr. C. R. G. BARRINGTON (Bromley) saw little hope: no other profession, he said, would put up with the treatment the doctors had received. To give evidence to the Royal Commission was another step down the ladder and towards the state of mind in which "we do exactly what we're told."

PUBLIC-HEALTH DOCTORS

Anxiety about the future of doctors in the public-health service found expression in an amendment declaring that evidence should be given to the Commission provided that either (*a*) all doctors in the public-health service be included within the scope of the terms of reference of the Commission or (*b*) that an undertaking be given by the Government that an independent inquiry into the remuneration and status of all public-health medical officers be set up immediately. Dr. J. A. STIRLING recalled the view recently endorsed by the council of the B.M.A.—that coöperation with the Royal Commission should depend on the inclusion of public-health doctors; and Dr. J. S. G. BURNETT spoke of the difficulties which faced those doctors in a service in which no cognisance was taken, as far as remuneration was concerned, of postgraduate training and in which it was hard for doctors to get in the forty years' service necessary for full pension rights. The meeting was clearly anxious to strengthen the position of colleagues in the public-health service, but many representatives felt, as did Dr. A. BROWN (Cambridge), that if they went on attaching impossible strings to the giving of evidence, they would do the public-health doctors a disservice.

Dr. J. B. TILLEY (Newcastle upon Tyne), chairman of the B.M.A.'s public-health committee, said that they had tried hard to get the Minister of Health or the chairman of the Royal Commission to take one of these courses. But not a shadow of a promise could be extracted. The public-health committee had decided to leave the decision to the special representative meeting. Dr. WAND observed that general practitioners and hospital staff were in dispute with the Government: the public-health doctors' dispute was primarily with local authorities. The evidence of doctors in the public-health service would be presented to the Royal Commission; and this amendment would defeat the intention to give evidence. Dr. Wand could see no reason why the profession should not give evidence so long as their rights to seek fulfilment of the Government's moral obligations were not prejudiced. By a large majority the meeting agreed that "the Association should give evidence to the Royal Commission on the understanding that it is given without prejudice to the profession's right to press for fulfilment of the Government's moral obligations inherent in the public and private assurances given by it and its predecessors to doctors taking part in the National Health Service."

WITHDRAWAL

This decision having been taken, there was no long debate on the issues concerning withdrawal from the National Health Service. The meeting agreed to defer a decision on withdrawal; but the emphasis was on preparedness, and representatives insisted that the machinery and method of withdrawal be kept under constant review and that the council should also proceed urgently with preparations for an alternative health service.

LEGAL ACTION?

The possibility of taking action to test the validity of the Spens report as a legal contract for general practitioners again roused interest, as it had done at the special representative meeting on May 1.[1] Dr. WAND said that legal advice was firmly against such a course; and when some representatives seemed dissatisfied, he spoke more fully on counsels' views. Dr. I. D. GRANT, the chairman, ruled that this part of the discussion be private.

Dr. B. BURNS (Sheffield) attributed this reluctance to go to court to fears that the public were "not on our side." It was not public opinion, however, but editorial opinion that was against them: "*The Times* has repudiated Spens. Let no dog bark." A motion calling on the council to test in the courts the validity of Spens as a legal contract for general practitioners was defeated.

PARALLEL DECISIONS

Dr. A. BEAUCHAMP, chairman of the annual conference of representatives of local medical committees, told the meeting of decisions taken at the conference on June 6. In view of the statements made publicly by the chairman of the Royal Commission and assurances given to Dr. Wand by the Minister of Health, the conference recommended that evidence should now be given. A decision on withdrawal should, it was agreed, be deferred; and another recommendation was that "the negotiating machinery be revised with a view to establishing effective coördination between the several branches of the profession and the prevention of unilateral action by any one branch." A motion was also passed instructing the General Medical Services Committee, in consultation with the council of the B.M.A., to prepare plans for an alternative national medical service.

1. See *Lancet*, May 11, 1957, p. 987.

In England Now

A Running Commentary by Peripatetic Correspondents

ALL normal boys want to be engine-drivers when they have nannies. Later their ideas develop and the nannies have to go. My nanny went too, but something went wrong, something in me failed to develop, and I have only lately discovered what it was. All through my school years, through M.B., B.S. to M.D., through houseman, S.H.O., registrar, S.H.M.O. and consultant pathologist, through my military service, I wondered what was wrong with me. During all my years of dutiful seaside holidays with the family I wondered why I was unhappy. Now I know—I still wanted to be an engine-driver.

And so it is that every holiday now finds me a " passed fireman " on the books of an old-time, half-size, obsolete railway line in Wales, alongside dozens of others suffering from the same complaint. I light the engine-fire and watch " her " get up steam, I clean and polish her, and then move her along to pull her train out. I talk railway jargon. Sometimes I forget and the passengers become patients. My companions are a cross-section—professional railwaymen, tally clerks, fitters, solicitors, policemen, accountants, lorry-drivers, company directors, and of course clergymen. Occasionally I see a colleague and I tease him. Yes, he remembers the face. 1938 ? St. Mary's ? The engineman's cap and overalls, the covering of coal and grime, overwhelm his cerebral processes and they grind to a halt. How can a contemporary be working thus ? Unless, yes, that must be it. It must be the work of the General Medical Council. After all it might happen to anyone. Volunteer, did you say ? This is only a summer holiday hobby ? Recognition dawns, freely, honourably, and obviously. Of course he remembers, and what a wonderful hobby. Reminiscences are interrupted by a shriek of the whistle. " Right away " it is, and the train moves off.

May I never grow up.

* * *

Occupational medicine in the North is a bit of a change. I now syringe ears to strains of *Music While You Work* and am no longer surprised by a " How do you do " in response to a proffered " Good morning." The uniformed gatemen have ceased to look grim and hostile, and their welcoming smile and wave compensate for the evil odours that assault me as I enter the factory. I drive past glistening rows of fitters' cars in my twenty-three-year-old vehicle, but realise that the display will save me a visit to the show-room when my ship comes home.

There are many surgery attendances on Mondays, when industrial hazards are eclipsed by football and Judo as sources of trauma. The chairman seems to burn as well as a shop-steward at the business-end of the cautery, and I find that the pain of a " strained back at work " may emanate from a renal calculus. I live in suspense lest patient and first-aider should meet before the former reaches the medical centre ; the practical effect of some answers at a recent viva would best be untried. There is an abundance of monosyllabic Christian names and a pleasing democracy extends even to the golf-club. I lately arrived at the first tee to admire the drive of someone whom I had that very day restricted to sedentary work.—But perhaps the amended certificate next morning was an aid to productivity. No discussion was necessary and a " fit " note thus achieved might be considered a " knock-out " as against the " win on points " which is so much more exhausting to the doctor.

At first the impact of industry depressed me, but after a few months the sullen faces that greeted a first anonymous tour of inspection were replaced by those of friendly patients, whose foibles are appreciated and who have themselves learnt that a description of the terrible job they are doing does not fall on green ears and may elicit a rapid and conclusive visit to the site. I find that the girls on seemingly monotonous and soul-destroying packing operations wouldn't change jobs if they had the chance—" what, use my brains for the company ? " They are far happier gossiping about boy friends and giving each other verbatim reports of the latest films. The greatest disturbance in their factory life is a change of working group. The art of evading leading questions is tested to the utmost, for in general practice I did not lunch daily with my patients and their associates. It is, however, possible to keep a check on the managerial coronaries by well-directed glances when the chipped potatoes are in range of unsuitable recipients.

Also I have a very nice pair of industrial shoes for which I paid 36*s*.

* * *

William, aged 12, represents the small line of pure-bred countryfolk still discernible among the welter of immigrant technicians in our Surrey town. Though by no means stupid, he is artless and all-trusting. His middle-ear infection had flared up a few weeks before his visit, and was now smouldering like a tired volcano, with an indolent lava-stream of pus lying on the meatal floor and the main furnace-flames visible, slowly pulsating, through the central perforation. The temptation to leave the healing to Nature was great, but the temptation to use an antibiotic was greater, and after a rapid twist of the mental roulette I settled for a well-known topical preparation in propylene glycol. " Use these drops in your ear three or four times a day," I said ; " right ?—And come again in a week."

He came. " How is the ear ? " I asked. " Much better, thank you, doctor " he replied. " No discharge any more ? " I asked. " No, thank you, doctor," he replied. " Well, let's have a look," I said, " Let's see now, which one was it ? " " This one," he answered, pointing to the right. " Are you quite sure ? " I queried. My notes said definitely it was the left. " Yes, doctor," he replied, " you said put them drops down the right ear and that's wot I done like you said, doctor."

I clapped a mental hand to my psychological brow and groaned inwardly. Then picked up the auriscope and looked. Sure enough, the volcano was extinct, no lava, no fires. The drum and meatus were clean and dry.

My thesis on the value of contralateral topical antibiotics in otitis media will soon be in the Editor's hands.

* * *

My new secretary smokes cigarettes but reads all your articles and letters about cancer and types out all my P.M. reports on cases of secondaries in the brain. The result is she is developing an anxiety state, and smokes more cigarettes than before.

* * *

My wife's description of her first air trip. It's wonderful—everything is done for you. It's just like having an operation.

* * *

Little Nurse Delaney has been taken away
And oh ! the difference to me !
She was the one who shook me pillows
Into a billow of cool white clouds.
And when dawn came jade-green
And the thrush began its lyric stave
On the chestnut tree outside my ward
She brought in the toast
Thin, hot,
No frame of tough crust.
Her fingers rested
Imponderably
On the fevered pulse.
(The new wench grips your wrist
Like an officer of the law.)
And she was the nurse
(My own Delaney)
Who took my teeth away
To wash under the tap
And brought them back
Cleansed, fresh-washed,
Pleasant to taste.
Oh where is my Delaney
Who pulled unruly ridge
From under draw-sheet mackintosh ?
And served me bed-pan
Warm as her own heart ?

Letters to the Editor

CONTROLLED TRIALS NEEDED

SIR,—I was delighted to read your annotation of June 15 about the need for controlled trials of therapy in hypertension, for this is a subject that has been causing us much worry in our hypertensive clinic.

Up to the present time, the medical control of hypertension has involved the use of drugs such as hexamethonium or pentolinium, together with reserpine, and the patient's life has been made difficult by the need for rigid control and the liability to side-effects. Under these circumstances we have felt it unjustified to treat symptomless or mild hypertension, and treatment has been reserved for those patients who had severe hypertension, marked symptoms, and a bad prognosis.

The recent introduction of mecamylamine may have altered this situation, for this drug appears to produce satisfactory control of blood-pressure with less risk of sudden hypotension and with little disturbance other than constipation. It is preferred by almost all our patients who have been transferred on to it from hexamethonium.

The group of hypertensive patients who cause us most concern are the young men, between 25 and 35, who are found, often by chance, to have a raised blood-pressure due to essential hypertension. The ultimate prognosis in these patients is poor, and many may develop serious symptoms or signs in the course of a few years.

A controlled trial of medical treatment in this special group of patients is urgently needed. As you say in your annotation, such a trial requires a coöperative effort. It presents far greater difficulties than the trial of streptomycin in tuberculosis, for not only must it be continued for years, but the subjects will feel fit and will be at work and yet their full coöperation is essential. So is that of their general practitioners. Another difficulty is that such a trial cannot be a blind one, for it will be obvious to both the patient and the doctor that an active constipating drug is being used.

I hope that, as a result of your suggestion, the Medical Research Council or some other body will investigate the possibility of organising such a large-scale controlled trial. We must find out whether the outlook for such patients can be improved by drugs, but the trial will also have to answer the question as to whether the end results justify the anxiety that must necessarily be aroused by such early treatment.

University College Hospital,
London, W.C.1. M. L. ROSENHEIM.

CONSULTANT AND SPECIALIST

SIR,—On behalf of S.H.M.O.s I wish to thank you for so lucidly putting the case for an increase in the number of fully trained specialists in the National Health Service. With the exception of the last paragraph of your leader of June 1 S.H.M.O.s are in sympathy with your views. But the final paragraph is far from reality: for instance, the fear that the Ministry would swell ranks to get cut-price consultants is not baseless; this may not be the intention, but in practice this is precisely what is being done throughout the country. Where there is a limit on the expenditure of regional boards, S.H.M.O. posts are created in place of consultant posts. On one occasion an administrative medical officer said "we cannot manage a consultant but we could run to a S.H.M.O."

The profession did suggest a definite ratio in the report on hospital medical staffing. This ratio was deleted altogether in the final report when returned from the Ministry and the proposed new grade had absolutely no safeguard against its unlimited expansion in *all specialties*.

Your statement that "our representatives have had no difficulty in securing strict observance of the agreement for limitation of S.H.M.O. posts" is not true. There has been gross abuse of the grade as follows:

(1) There has been a big expansion of the grade as compared with the consultant grade, especially in certain specialties, such as chest diseases and psychiatry.

(2) S.H.M.O. posts have been created where definite consultant work is to be done on the grounds of "supervision" by a consultant who is miles away and who in certain cases never visits the hospital or clinic.

(3) Figures of S.H.M.O.s as given in official lists are misleading as the general-practitioner S.H.M.O.s who retire or leave the service are seldom replaced by S.H.M.O.s: the positions are offered to G.P.s as clinical-assistant posts.

Any new grade whether it is called assistant consultant, trained specialist, or, as at present, S.H.M.O. must be controlled by a strict ratio approved by the profession and accepted as a strict rule by the Ministry.

G. WARING ROBINSON
Leicester. Chairman, S.H.M.O. Group, B.M.A.

POSTOPERATIVE COLLAPSE DUE TO ADRENAL INSUFFICIENCY

SIR,—I was very interested in the paper by Mr. Slaney and Mr. Brooke (June 8) because their experience agrees closely with my own. There are, however, other relatively common causes of postoperative adrenal failure which are not generally recognised.

The causes of adrenal failure may conveniently be classified as follows:

Primary adrenal failure:
Removal: adrenalectomy.
Destruction: Addison's disease, traumatic adrenal apoplexy.
Exhaustion: toxæmia and starvation.
Dysfunction: virilising hyperplasia.

Secondary adrenal (primary pituitary) failure:
Removal: hypophysectomy.
Destruction: Simmonds's (Sheehan's) disease, pituitary tumours.
Inhibition: therapy with cortisone and its analogues and with corticotrophin.

I would like to comment on two of these.

First, Addison's disease may easily be overlooked, especially in an emergency, in a patient with some other condition which requires surgery. Operation is followed by peripheral circulatory failure which may well prove fatal. In early or mild cases the first clinical sign of adrenal insufficiency may be severe prolonged hypotension after the stress of an operation. In such circumstances, if no cause can be found for the collapse and if there is no response to blood transfusion, adrenal insufficiency should be suspected and treatment with noradrenaline and hydrocortisone should be given at once. The noradrenaline can be withdrawn when the hydrocortisone starts to take effect. On several occasions this has proved life-saving.

Secondly, starvation, which may cause "adrenal exhaustion," is not uncommon in patients who have to be "dripped and sucked" for long periods after an operation. I have had two such cases in the past year—one following gastrectomy and one after transplantation of the ureters—in both of whom the systolic blood-pressure fell to about 80 mm. Hg after 2 to 3 weeks. Adrenal insufficiency was suspected in both, hydrocortisone was given, and the blood-pressure was restored to normal within 24 hours.

Death from adrenal failure must be regarded as a tragedy since it is largely avoidable. Experience has led me to formulate the following rules:

(1) The conditions which may cause adrenal failure must be borne in mind.

(2) If time allows, adrenal function should be assessed before operation in those in whom it may be deficient.

(3) Supportive therapy should be given when necessary. If in doubt it is better to give support than to withhold it.

(4) The clinical picture of adrenal insufficiency must be recognised early and the condition should be suspected in any case of unexplained hypotension following an operation.

(5) Treatment must be given as soon as the condition is suspected, otherwise it may be too late. The therapeutic response to hydrocortisone is often the only way of confirming the diagnosis.

A fuller account of this important subject was presented to the surgical section of the Royal Academy of Medicine in Ireland in February and is now in the press.

The Queen's University of Belfast. RICHARD B. WELBOURN.

SERUM-LIPIDS IN ISRAELI COMMUNITIES

SIR,—In view of the topical discussion on the ætiology of atherosclerotic coronary-artery disease and its relation to hereditary and nutritional factors, we would like to refer to our research in Israel.[1]

Among the Jews in Israel, there is a homogeneous group of Ashkenasian Jews, whose ancestors lived in Europe for hundreds of years and, for the past 80 years, in the United States of America and South Africa. On the other hand, the forefathers of the Sephardic community lived in the countries of the Middle East or among the Arabs. The same mortality and morbidity from arteriosclerotic and from coronary-artery diseases prevails among Ashkenasian Jews as generally in England and the United States; Sephardic Jews, on the other hand, are much less prone to these disorders. Among Sephardic Jews there exists one community, the Yemenites, of whom there are now in Israel 118,800 people. Coronary-artery disease is practically unknown among Yemenites, and hardly any clinician can recall Yemenite patients with myocardial infarction in his ward.

The Yemenites are Jews who have lived for thousands of years in the Yemen, in the peninsula of Arabia. They lived in a secluded society having no relations with any other Jews in the world; they were also very little in touch with the Arabs surrounding them. As a result they preserved the traditions and the way of living of biblical Jewry, and Hebrew remained the language of daily use during all the years of the Diaspora.

We examined the serum-cholesterol, serum-phospholipids, and cholesterol/phospholipid ratio in four groups of healthy males—recently arrived Yemenite immigrants, Israeli Arabs, Yemenites who had lived for 25 years in Israel, and Ashkenasian Jews. Each group consisted of fifty men aged 35–50. Later we added another group of twenty-five men who had had myocardial infarction (clinical and electrocardiographic diagnosis). As the average age of these men was higher than that of the healthy groups, another series of matched controls (same age and community membership) had to be taken into account. Most of the men in these two groups were Ashkenasians.

The recently arrived Yemenite immigrants had a very low serum-cholesterol (see accompanying table). It was even lower than the average serum-cholesterol in the Bantu.[2] On the other hand, the levels in Ashkenasian Jews were equivalent to those seen in Western Europe and the United States. Between these lay the other two groups. The serum-cholesterol and serum-phospholipids of patients with myocardial infarction were higher than those of the healthy Ashkenasians and resembled those cited in the literature. The values of the matched controls were the same as those of the healthy Ashkenasians. Thus it was not the age difference which caused the rise in the plasma-lipids.

The various differences in the serum-cholesterol from group to group were definitely statistically significant.

The difference between the serum-cholesterol in the recently arrived Yemenite immigrants and that in Yemenite residents was also definitely statistically significant; but there was almost no difference in the serum-phospholipid levels between the two Yemenite groups. As a result the cholesterol/phospholipid ratio in the Yemenite residents was much higher than in the recently arrived Yemenites and amounts even to a little more than this factor in the Ashkenasians. Gertler et al.[3] thought that the cholesterol/phospholipid ratio was a more important measure of atherogenic activity than the level of either single lipid.

The change in a Yemenite group in one generation is expressed in a rise in serum-cholesterol without a corresponding rise in the serum-phospholipids. In general the way of living in Israel is the characteristic Western way, and we want to suggest the possibility that this change may give us a clue to the kind of acclimatisation that takes place in the lipid metabolism of Yemenite immigrants. The differences between the two groups of Yemenites also contribute a point to the discussion whether the variations of lipid levels are the result of hereditary or of nutritional and other environmental factors. The experience with Yemenites in Israel shows that there is no significant hereditary factor present.

Lately we surveyed the nutrition of a group of recently arrived Yemenite immigrants.

These Yemenites are peasants who live in a *moshaw owdim* (a village with communal distribution of the soil) near Jerusalem. They live by agriculture and most of them also partly on paid day-labour. The nutritional survey was done by Yemenite nurses who could make easy social contacts with the tested individuals. The nurses lived in the village during the period of the survey and weighed the food of all male members of the families for a whole week. Thus, twenty-five men, 35–50 years old, were examined individually for a week. The results showed that these Yemenites ate food yielding 2200–3000 calories a day. The main part of their nourishment was bread (on the average 600–900 g. a day), which means that they received the greater part of their calories and proteins from bread. They ate on the average 30–50 g. fat a day—i.e., about 11–18% of their daily calories were derived from fat. They ate many raw vegetables and very little cooked food. They used much spice. Cheese, margarine, and butter were entirely unknown to them. They dipped their bread in olive oil or similar vegetable oils, and used them for cooking.

The customary food of the Ashkenasians in Israel is similar, in its form and composition, to the usual food in England and the United States.

1. Brunner, D., Löbl, K., Fischer, M., Schick, G. *Harefuah*, 1955, **48**, 1; quoted in *J. Amer. med. Ass.* 1955, **158**, 1305.
2. Bronte-Stewart, B., Antonis, A., Eales, L., Brock, T. F. *Lancet*, 1956, i, 521.
3. Gertler, M. M., Garn, S. M., Bland, E. F. *Circulation*, 1950, **2**, 517.

SERUM-LIPID LEVELS IN MEN OF VARIOUS COMMUNITIES IN ISRAEL

Group	Average age (yr.)	Average serum-cholesterol (mg. per 100 ml.)	Range	Average serum-phospholipids (mg. per 100 ml.)	Range	Average cholesterol/phospholipid ratio	Range
Ashkenasians	46·1	231	148–346	305	235–415	0·76	0·52–1·07
Yemenite residents	46·3	194	128–279	251	185–358	0·77	0·60–0·95
Arabs	47·0	177	105–304	270	213–347	0·66	0·45–0·90
Recent Yemenite immigrants	44·9	149	98–208	251	182–416	0·61	0·38–0·93
Myocardial infarction	53·0	299	201–413	328	246–425	0·92	0·70–1·35
Matched controls	53·0	228	154–354	301	243–380	0·75	0·54–1·02

It seems to us that all these results may add a little more to our knowledge of the relations between nutrition, lipid metabolism, and coronary-artery disease.

Government Hospital Dowolo, Jaffa, Israel. DANIEL BRUNNER
K. LÖBL.

X RAYS AND LEUKÆMIA

SIR,—Professor Sonnenblick's letter of June 8 asking for further information regarding the work of Dr. Stewart and her colleagues in relation to possible risks attached to radiodiagnosis in pregnancy is a valuable contribution to this problem. The greatest possible publicity should be given to all evidence which points in a different direction, lest patients be wrongfully deprived of life-saving information. He is apparently unaware that a much more exhaustive survey is in progress here, at the instigation of the British group; and it is to be hoped that other countries may follow our lead.

It is, however, deplorable that he should take exception to your publications on this subject as premature. His pontifical and avuncular judgments read oddly in an age when freedom of expression of scientific opinion has been accepted; they would have been familiar to Galileo.

I have no doubt that you, Sir, will continue to publish communications from qualified persons, and from departments of repute, regardless of the corns that may be exposed to trauma, on either side of the Atlantic.

The quickest way to dispose of data wrongly interpreted is to publish them as soon as possible. The sooner doctors learn of possible risks to their patients the better. In an age bedevilled by political issues and vested interests in all aspects of radiation, nothing but harm can issue from attempts to impose a censorship on scientific and medical publications. No important scientific fact has ever been established without honest contradiction by well-qualified experts.

London, S.W.3. R. J. V. PULVERTAFT.

CIRCUMCISION WITH BONE-CUTTERS

SIR,—I was interested to read Dr. Skeggs's contribution (June 8) towards greater safety in the technique of circumcision using bone forceps. I agree that this method is employed only too seldom, and this is all the more unfortunate in view of its many advantages. Few operations offer such economy of time or materials, with complete absence of bleeding; and by comparison with the conventional alternative it assumes a distinctly æsthetic nature (leaving strictly aside all controversy as to indications for operation).

There is no doubt that its lack of popularity in this country is mainly due to the very natural fear of injury to the glans. Another important factor is failure to obtain separation of the two mucosal surfaces without disturbing the sealed mucocutaneous edge. The resulting hæmorrhage and crestfallen call for sutures forms an embarrassing anticlimax to an impressive bloodless amputation.

In order to prevent this latter complication I should like to describe another point of technique which I have found of help. This is to insert a slip of corrugated rubber underneath the foreskin so that it lies alongside the glans. The bone forceps are then applied. On their removal, the corrugated rubber has sufficient resilience to spring apart and reveal the correct plane. Further separation is then easily effected with a dissecting forceps with no risk of disturbing the mucocutaneous seal.

A further word to nervous beginners: one should not confuse the sensation as the bone forceps cuts through the rubber and think that the worst has happened! This has often given my younger colleagues an unnecessarily anxious three minutes.

Glasgow Royal Infirmary. F. T. CROSSLING.

TOWARDS SAFER CLOTHING

SIR,—The marketing of flame-proofed materials and garments is at the moment in the stage of "teething troubles"—hence Dr. Woodliff's difficulty (June 1) in getting pyjamas. About a year ago several manufacturers became interested in one process of proofing, but the price was high and the makers ran into some technical difficulties when they started applying it on a large scale, with the result that some samples supplied to the shops were stiff and did not stand up to hard wear for children's clothes. This was unfortunate and has given a set-back to the supply and demand.

Meanwhile, at least two other processes have been undergoing trials but naturally the manufacturers prefer to go slow and not risk another false start. It is hoped (but not certain) that one or both of these may be ready for the market by next autumn—and perhaps also an improved version of the original process.

Other possibilities are also on the way. For example, one firm has produced a very attractive "raised" nylon which may well become a serious competitor to proofed flannelette, but this has not yet completed its trials I gather.

The best plan for the time being, to avoid unproofed flannelette, is to get pyjamas of a light-weight woollen material, or of ordinary nylon or 'Terylene.' (Mixed wool and cotton are almost as flammable as cotton alone.)

Farnham Royal, Bucks. LEONARD COLEBROOK.

AUTO-ANTIBODIES IN ADDISON'S DISEASE

SIR,—The claim made by Dr. Anderson and his colleagues (June 1) that they have demonstrated an auto-antibody to adrenal tissue in patients suffering from Addison's disease is of considerable interest. Although this was a preliminary communication, we feel that it is open to criticism.

Firstly, no proof is produced that the complement-fixation reaction they have encountered is truly immunological—namely, that it is a property of the globulin fraction of the serum and that it can be inhibited by absorption of the serum with a specific antigen. Secondly, their suggestion that two different antibodies are involved in the reactions between the serum and extracts of thyroid and adrenal is not supported by cross-absorption or gel diffusion tests, or by accurate titration of the serum against the two extracts. Thirdly, the presence of an organ-specific antigen, such as thyroglobulin, has not been demonstrated. Failure to acquire immunological tolerance has been suggested as the explanation for Hashimoto's disease. It is difficult to conceive of any derivative of the adrenal which is normally shut off from contact with sites of antibody production in a manner similar to thyroglobulin and which could therefore become an auto-antigen. Fourthly, there is no evidence, as yet, that the antibody detectable in Hashimoto's disease is actually responsible for the pathological changes, though it would appear that this is so in the rabbit immunised with its own thyroid gland.[1] Fifthly, if the reaction is an immunological one, Dr. Anderson and his colleagues have demonstrated an iso-antibody rather than an auto-antibody. This is true of the work of Roitt et al.[2] in Hashimoto's disease, though it has subsequently been shown that an auto-antibody occurs.[3]

It is to be hoped that these questions will be answered soon and unequivocally. Many unconfirmed claims of the presence of auto-antibodies have been published in the past decade. Some of these have been critically reviewed in your columns [4] and similar criticisms are applicable to other work. With the exceptions of paroxysmal hæmo-

1. Rose, N. R., Witebsky, E. *J. Immunol.* 1956, **76**, 417.
2. Roitt, I. M., Doniach, D., Campbell, P. N., Hudson, R. N. *Lancet*, 1956, ii, 820.
3. *Ibid*, May 25, 1957, p. 1075.
4. Annotation, *Ibid*, Feb. 16, 1957, p. 362.

globinuria and Hashimoto's disease, there has been no unequivocal demonstration of an auto-antibody in human disease. We feel that it is important that strict criteria, such as those laid down by Witebsky at the meeting of the British Society for Immunology last month, should be fulfilled before the presence of auto-antibodies is claimed or accepted in any disease.

BRUCE CRUICKSHANK
A. R. CURRIE
T. SYMINGTON.

University Department of Pathology, Royal Infirmary, Glasgow, C.4.

SEASONAL INCIDENCE OF MEGALOBLASTIC ANÆMIA OF PREGNANCY AND THE PUERPERIUM

SIR,—I feel that Dr. Thompson's reference (June 8) to a paper by Vinke and Van der Sar [1] should not pass without comment. The statement made by these Dutch workers is: "As the minimal quantity of folic acid required by man is 200 μg. a day (Williams et al. 1950 [2]), the stock in the liver is sufficient for 15 or 30 days when the diet is completely lacking in folic acid." This is used both by Dr. Thompson and by the Dutch workers as an explanation of why megaloblastic anæmia of pregnancy in temperate zones is due to deficiency of folic acid rather than vitamin B_{12}; it is generally agreed that the stores of vitamin B_{12} will last for months or even for years.

The fact is, however, that this theory has not previously been accepted because the daily requirements of the human for folic acid are quite unknown. They *may* be 200 μg. per day, but even Williams et al.[2] do not claim this. Indeed on p. 325 of this book they state that "The quantitative requirement (for folic acid) cannot be closely estimated from evidence now available." The figure of 200 μg. per day is put forward by them on p. 326 in a table as a recommended allowance in view of the lack of knowledge, and reference is made to a paper by Williams [3] which in fact says that it is not even known that folic acid is required for the human. (This was in 1942.)

It is easy to observe a human developing vitamin-B_{12} deficiency, since this will occur after total gastrectomy because of lack of intrinsic factor, but to produce folic-acid deficiency alone is not practicable.

However, some idea of the order of magnitude of the daily requirement of folic acid might be obtained by finding the minimum effective daily oral dose in patients with nutritional megaloblastic anæmia who had normal folic-acid absorption, a normal serum-vitamin-B_{12} level, and normal absorption of labelled vitamin B_{12}. Another less physiological method of approach would be to find the minimum effective daily injected dose in patients with idiopathic steatorrhœa and megaloblastic anæmia whose absorption of labelled vitamin B_{12} was normal and whose absorption of folic acid was impaired. In both instances the possibility of complicating ascorbic-acid deficiency would require consideration, and in any case some of the administered dose might be deviated to functions other than restoration of normal erythropoiesis.

It is likely that some cases of megaloblastic anæmia in pregnancy in temperate regions are due to folic-acid *deficiency* and in some instances the output of folic acid after a test dose has been low.[4] However, many patients with extremely poor diets do not develop megaloblastic anæmia in pregnancy, and some who do develop it are in good circumstances, eat a normal diet, and have no complicating factors such as vomiting, diarrhœa, or multiple pregnancy. To complicate the matter even more, Okuda and his co-workers [5] in Baltimore have claimed that very low serum-vitamin-B_{12} levels may be obtained even in normal pregnant women at the time of delivery, and consider that the fœtus deprives the mother of the substance.

In summary, the theory of Vinke and Van der Sar is attractive, but we do not really know whether the body stores of folic acid will last for 30 days or for 600. As Dr. Thompson says, dietary deficiency is probably an important contributory cause in megaloblastic anæmia of pregnancy even in temperate climates, but other unknown factors appear to play a part.

Department of Medicine, University of Edinburgh. R. H. GIRDWOOD.

1. Vinke, B., Van der Sar, A.: *Docum. Med. geogr. trop.* 1956, **8**, 151.
2. Williams, R. J., Eakin, R. E., Beerstecher, E., Shive, W. The Biochemistry of B-vitamins. New York, 1950.
3. Williams, R. J. *J. Amer. med. Ass.* 1942, **119**, 1.
4. Girdwood, R. H. *Quart. J. Med.* 1956, **25**, 87.
5. Okuda, K., Helliger, A. E., Chow, B. F. *Amer. J. clin. Nutr.* 1956, **4**, 440.

DIVISION OF INTERCOSTAL ARTERIES

SIR,—In your report of the Anglo-French surgical conference (June 8) the question of dividing intercostal arteries and the safety of doing so was raised by Jean Cauchoix and Jean-Paul Binet with the words "there is still no final answer in man."

Presuming the danger to be interference with the circulation of the cord, I should like to point out that the circulation of the cord was worked out by Kadyi in 1889 and his work confined by Suh and Alexander in 1939. The latter point out that Tanon emphasised the importance of the lumbar radicular vessels in the blood-supply of the whole cord and that the middle thoracic section of the spinal cord has the poorest local segmental circulation.

Our experience supports this: in 106 cases of anterior fusion, Prof. F. E. Stock and I have divided up to as many as eight intercostals in a single patient without any complications. I think the most dangerous area is the lumbar and it is in the thoracolumbar region that the danger lies. I hope this will fortify those who might be deterred from using this excellent approach to the thoracic spine by the words "there is still no final answer in man."

University of Hong-Kong. A. R. HODGSON.

MECHANISMS OF PERIODIC PARALYSIS

SIR,—It was with particular interest that I read your leading article of April 20 and the article by Professor Conn and his colleagues in the same issue.

I agree entirely that the underlying mechanism of periodic paralysis is not identical in all cases. At least one other condition can produce symptoms similar to those of familial periodic paralysis. In April, 1956, I described [1] a disease which, like periodic paralysis, is characterised by attacks of paralysis, especially during rest after exertion. The disease is hereditary and the inheritance is due to a single, autosomal, dominant gene with complete or almost complete penetrance. Clinically the disease differs from periodic paralysis in the following respects: it begins earlier in life (in 90% before the age of 10 years); the attacks are more frequent, shorter, and less severe (75% of the patients have at least one attack a week, and the attack lasts at most 1 hour, during which the patient is usually not completely helpless); the attacks are more liable to occur when the patient is hungry, and the intake of food, especially of bread, has a good prophylactic and therapeutic effect. During an attack the serum-potassium is increased without any accompanying decrease in the urinary excretion of potassium, and the electrocardiogram shows high pointed T waves. Like rest after exertion, 1–2·5 g. of potassium by mouth will precipitate an attack. The administration of glucose has a good prophylactic effect.

Of the published reports of familial periodic paralysis, some, such as that of Tyler et al.,[2] appear to fit in well with the picture of adynamia episodica hereditaria. In

1. Gamstorp, I. *Acta pædiat., Stockh. suppl.* **108**, 1956.
2. Tyler, F. H., Stephens, F. E., Gunn, F. D., Perkoff, G. T. *J. clin. Invest.* 1951, **30**, 492.

other words, the description of the mode of inheritance, the clinical picture, the absence of decreasing serum-potassium during an attack, and the lack of response to potassium therapy suggest that the patients really had adynamia episodica hereditaria.

Since Tyler et al. found vacuoles in the muscle-fibres, this finding cannot be pathognomonic of periodic paralysis. The mechanisms of the two diseases must be different, which does not, of course, exclude the possibility of vacuoles occurring in the muscle-fibres in both conditions. Microscopic examination of muscle-biopsy specimens from 3 of my patients, however, failed to reveal any such vacuoles.

Barnsjukhuset, Lund, Sweden. INGRID GAMSTORP.

CHILDREN IN HOSPITAL

SIR,—What a pleasure it is to read a paper like that of Dr. Vaughan in your issue of June 1. The point of his investigation—the presence or absence of explanation to children, before admission, of what was going to happen to them in hospital—is an important one. As he points out, most of these children were confused and frightened on admission, and twenty-six weeks after discharge 11 of the children to whom no explanation had been given, as against 3 of those to whom matters had been explained, were still disturbed.

This inquiry raises a point very familiar to child psychiatrists—of the loss of confidence in their parents felt by children given lying statements by their parents about the reasons for their visit to a hospital of which inpatient admission is the (to the child) unexpected outcome. As Dr. Vaughan reports, some parents are unable to explain what is to happen to their children and some are definitely frightened to do so. At present no provision is made for the preparation of children about to come into hospital in our outpatient and inpatient routine handling.

During two years spent in the wards of the Royal Hospital for Sick Children, Glasgow, under Prof. Leonard Findlay on an M.R.C. inquiry which involved direct contact with the children's families, I was much struck with the help that could be given, both to the progress of the child in hospital and to wise aftercare by his family, by simple explanations to both sides concerning the procedures the child was experiencing in hospital.

As Dr. Vaughan points out, three things are necessary: (1) explanation to parents of the importance to their future relations with their children of a truthful account of the reasons for the child's visit to hospital; (2) explanation to the child himself of what is going to happen to him in hospital (and in every case this should include explanation of the meaning of, to the small child, so mysterious a procedure as the use of the injecting needle); and (3) opportunity for the child to express his fears and receive comfort and reassurance.

Is not this a sound opportunity for coöperation between the psychiatric and the pædiatric branches of our children's services? And would something like the following not possibly meet the case?

(1) The psychiatric social worker, should there be one in the hospital, or if not a member of the nursing staff with special training to meet this need, should have a talk in the outpatient department with each mother whose child has been put down for admission to hospital. Such an interview should contain an explanation of what is to happen to the child while in hospital and persuasion of the mother to prepare her child for it. Fear is catching; children catch it from their mothers. Such a procedure would give an opportunity to the mother to ventilate her own fears about hospital admission for her child and to be reassured.

(2) In every children's department, and particularly in relation to surgical wards, it should be the duty of one of the resident medical staff to see all children for a brief period immediately after admission to explain to them carefully just what is about to happen, and to assure them of a future friendly visit and opportunity for a talk over anything that has puzzled or frightened them shortly after the completion of an operation.

(3) All outpatient children's physicians should be asked, on the child's reporting visit after discharge from hospital, to inquire specifically about symptoms of disturbance, and if these are present to refer the child at once to the psychiatric clinic.

(4) Simple leaflets should be prepared for use in the outpatient department and by general practitioners, setting out clearly the importance of explaining to children going into hospital what is awaiting them, and telling parents whom to ask if they are puzzled as to how to do this or if they later find their child upset by his experiences in hospital. The parent bringing the child to outpatients could be encouraged to take this leaflet home to discuss with the other parent and older members of the family, so that a period in hospital for a child could become more of a corporate event in which all the family is interested, instead of being, as so often at present, a mysterious experience in which the child feels afloat on a very small raft out of sight of familiar land or faces.

As a step towards the achievement of these objectives, would it not be possible for the child psychiatrist to the hospital to give short talks to nursing and resident staff, explaining the grounds for these additional, and which may seem to an over-worked staff tiresome, additions to routine and the good harvest that can be reaped by them in understanding home management of their small patients after discharge and an increase in mental health of the children?

London, W.11. MARGARET LOWENFELD.

EPIDEMIOLOGY OF POLIOMYELITIS

SIR,—In your leader of April 20 you say "Recent studies have made clear the reasons for the striking differences in the incidence of paralytic poliomyelitis between countries with high and with low standards of living."

The evidence brought forward fully explains the rising age-incidence in countries with a high standard of living but, as Dr. Pease and I[1] recently pointed out, it does not explain the recent increase in paralytic disease in under-developed countries, nor the variation in the severity of attack in countries with a high standard of living (cf. Denmark in 1952).

Hammon et al.[2] have suggested that paralytic poliomyelitis in the Philippines may be due to the importation of "paralytic strains" from the United States, and a similar explanation could account for the epidemics in Malta and Madagascar during the late war and in many other countries, such as Israel and Kenya,[3] since then.

In other virus diseases, such as smallpox, strains exist of the same immunogenic type, but of varying virulence and giving rise to a varying severity of illness.[4] In smallpox the difference in virulence is so marked that two distinct forms are recognised and known as variola major and variola minor, or alastrim.

Clinical cases of poliomyelitis are most frequently associated with type-1 viruses, but evidence is accumulating that the severity of an epidemic depends more upon the virulence and neurotropism of the strain of the virus than upon its type.

Tanganyika is a country with a low standard of living and very poor communications, and yet in 1954 there was a severe localised epidemic of paralytic poliomyelitis among susceptible infants, with 99 cases among a total population of approximately 100,000, and in 1956 there was an even more severe outbreak at Kakonko with an incidence of 275 cases in a similar population.

The fact that paralytic poliomyelitis, or "polio major," has taken so long to penetrate Africa since its

1. Kerr, W. G., Pease, N. J. *Brit. med. J.* 1956, i, 1337.
2. Hammon, W. McD., Ludwig, E. H., Sather, G. E., Schrack, W. D. jun. *Ann. N.Y. Acad. Sci.* Sept. 27, 1955, p. 979.
3. Walker, A. J. *East Afr. med. J.* May, 1956, p. 169.
4. Conacher, D. G. *Ibid*, May, 1957, p. 157.

first appearance in the 1880s, is probably due to the high degree of immunity which has been developed there by repeated epidemics of "polio minor" and to the difficulties of communication. The existence of previous epidemics of the non-paralytic disease is shown by the immune state of the majority over the age of 5 and by the sporadic cases of paralysis that have occurred in the past. Their existence is further supported by the type of research carried out by Melnick et al.[5] to which you refer.

Ocean Road Hospital,
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Tanganyika. W. G. KERR.

CÆSAREAN SECTION

SIR,—Few of your readers interested in modern cæsarean section would endorse all the views expressed in your leading article of April 6. Many would be in fullest agreement with Prof. Dugald Baird and Mr. Terence Robinson (April 27) and Mr. Higgins (April 20). Merely to repeat the view that all other methods of delivery will become obsolete is to perpetuate an absurdity.

Dr. Salzmann's letter (May 25) calls for comment. In a symposium on general-practitioner midwifery services last year,[6] it was pointed out, in discussing the place of cæsarean section, that a survey of 30 large maternity hospitals, mostly teaching, for the five years 1951–55 showed the section-rates to vary from as high as 14% to as low as 1·5%. These units included all the well-known British teaching hospitals as well as prominent units in the U.S.A., Australia, New Zealand, and Eire. It may well be true, as Dr. Salzmann states, that some hospitals in this country show what may be deemed an unnecessarily high section-rate, but the average yearly rate for the group of hospitals analysed was 5·1%, and if the results of the group studied by Marshall and Cox [7] are re-examined for the period 1951–55 the average yearly rate is shown to be 6·1%, which is almost exactly the figure quoted by those authors for 1943–1947—i.e., 6·2%.

The criticism by the prominent member of the Royal College of Midwives, to which Dr. Salzmann refers, seems therefore a little ungracious without a fuller knowledge of the conditions obtaining in the particular hospitals to which she alludes.

Liverpool. H. VINCENT CORBETT.

ANÆSTHESIA FOR CÆSAREAN SECTION

SIR,—The letter by Dr. Margaret Watkinson (June 15) has stimulated us to make a plea for the abandonment of the long-established ritual of "slash-and-grab" cæsarean section. For the obstetrician who stands beside his patient about to be delivered by cæsarean section, prepared with scalpel poised to extract the fœtus at a word from the anæsthetist, will allow his forceps cases to be anæsthetised whilst preparing the vulva, catheterising, and draping the patient before he is ready to commence vaginal delivery. Forceps extraction is then performed slowly and deliberately, without haste or rush.

It is our practice to anæsthetise patients for cæsarean section before subjecting them to the frightening experience of skin preparation and draping. The operation itself is unhurried and the benefit to the mother of the slower and gentler surgery has been achieved without increased risk to the fœtus.

The anæsthetic technique employed is briefly as follows:

Induced by the inhalation of cyclopropane and oxygen, the patient is maintained at the lightest possible plane of surgical anæsthesia with nitrous oxide and oxygen, augmented with a little cyclopropane if necessary. All cases are intubated, a cuffed Magill orotracheal tube being passed under suxamethonium (succinylcholine)-induced paralysis. Respiration is controlled, relaxation being produced by intermittent administration of suxamethonium, and light-plane anæsthesia is maintained with nitrous oxide and oxygen.

It is not our intention here to advocate any one method of anæsthesia for these cases, or to compare general with local, spinal, or extradural anæsthetic techniques. Neither is unnecessary slowness condoned; in cases of fœtal distress surgery is performed with expedition, as in forceps delivery for this condition.

We make no claim to originality in contending that no greater speed is required in delivery of the fœtus per abdomen than per vaginam, and that, with an anæsthetic technique embodying good oxygenation with a light-plane general anæsthetic, "slash-and-grab" cæsarean section is a ritual to be abandoned.

St. George's Hospital,
London, S.W.1. DAVID SAVAGE.
Queen Victoria Hospital,
East Grinstead. DAVID HUGHES.

5. Melnick, J. L., Walton, M., Isacson, P., Cardwell, W. *Amer. J. Hyg.* 1957, **65**, 1.
6. Rogerson, J. P. G., Corbett, H. V. Transactions of the Liverpool Medical Institution, 1956. p. 39.
7. Marshall, C. M., Cox, L. W. Transactions of the 12th British Congress of Obstetrics and Gynæcology, 1949, p. 30.

MECHANICAL FACTORS IN ATHEROSCLEROSIS

SIR,—I was very interested to read the article by Professor Duguid and Dr. Robertson in your issue of June 15. The importance of these factors was strikingly demonstrated during some work on post-mortem arteriography by Dr. K. D. Keele and myself.[1] One of the subjects had wasting of one of the lower limbs due to tuberculosis of the hip and knee as a child, and on this side the arteries were almost devoid of disease, whilst those on the other showed all the features of atherosclerosis.

St. Peter's Hospital,
Chertsey, Surrey. C. F. ROSS.

INFLUENCE OF THE CEREBRAL CORTEX ON SODIUM EXCRETION

SIR,—A conditioned diuretic reflex in the dog was first described by Bykow and Alexejew-Berkmann,[2] who administered water repeatedly per rectum in dogs. After a certain number of trials, taking the dog into the experimental room and putting it on the stand was enough to elicit an increase in diuresis.

In our own experiments, the conditioned diuretic reflex was obtained by giving water by mouth. Loading with water resulted in the well-known phenomenon of unconditioned water diuresis. After a suitable number of experiments the conditioned reflex was established and the diuresis increased without water intake when the dog was on the stand.

In this conditioned diuresis, the urinary excretion of sodium was very high, whereas in the unconditioned diuresis it was very low. To use modern terminology, the unconditioned water diuresis is characterised by a high positive free-water clearance, with a negligible osmotic clearance. In the conditioned diuresis, the positive free-water clearance is relatively low and the osmotic clearance is high. The "conditioned-reflex" nature of the phenomenon is proved by differentiation. Creatinine excretion being virtually unchanged, the cause of the increase in the excretion of sodium is apparently a reduction in tubular reabsorption.

Our observations suggest that the conditioned reflex may differ from the unconditioned reflex, and that the cerebral cortex may also directly influence tubular reabsorption.

A detailed account of our experiments, in coöperation with Dr. M. Gerbner and Dr. K. Altman, will be published elsewhere.

Physiological Institute,
University of Budapest. P. BÁLINT.

1. Ross, C. F., Keele, K. D. *Angiology*, 1951, **2**, 374.
2. Bykow, K. M., Alexejew-Berkmann, I. A. *Arch. ges. Physiol.* 1930, **224**, 710.

Public Health

Training for the New Public Health

THE evolution of a specialty tends to follow a recognisable pattern. There is the recognition of a need; the pioneer attempts to meet that need; the hiving-off of the pioneers' successors into a new caste with a special training, qualifications, rituals, and jargon; the inclusion of the specialty's basic content in the undergraduate curriculum; and eventually its expansion at the expense of others, its decline, or its modification. Surveys of the status of training in the subject form milestones along the road.

A milestone along the road of public health is the World Health Organisation's monograph by Professor Grundy and Professor Mackintosh.[1]

To this an international character has been imparted by including summaries of W.H.O. conferences at Nancy (undergraduate, 1952) and Göteborg (postgraduate, 1953), and by submitting the text to leading public-health educators in eight countries. In addition there is a factual survey of the position in nineteen countries—perhaps too much compressed, however, for in the fifteen lines given to undergraduate training in London, for instance, it does not bring out the widely varying standards and the relative neglect of the subject in comparison with provincial schools and with many foreign countries. Here a comparison with the similar survey by Prausnitz [2] in 1932 would have been interesting.

The main theme is the change of emphasis from environmental public health to social medicine—from water-closets to welfare, in fact—which some may reckon a rash change when the subject is in a state of flux. Perhaps, therefore, the words "social medicine" should have been included in the monograph's title, particularly as there is a school of thought, notably in Scandinavia and the Netherlands, which holds that public health and social medicine cannot be combined in one professorial chair.

It is on such subjects as the three prevailing types of curriculum (traditional, intermediate, and comprehensive social), the problems of nomenclature, and the extent to which social medicine is a specialty that the authors are at their best. All concerned should be grateful to them and to the World Health Organisation for their intelligent and important survey of where we are and whither we are likely to go in the ill-defined and almost hedgeless fields of public health, hygiene, and preventive and social medicine.

Poliomyelitis

Uncorrected notifications for poliomyelitis in the week ending June 8 (23rd week of the year) were as follows (previous week in parentheses): paralytic 48 (42), non-paralytic 26 (25); total 74 (67). The following figures compare this year's notifications with those in the preceding nine years:

Year	*Total cases up to and including 23rd week*	*Cases in 23rd week*
1948	597	14
1949	383	19
1950	840	79
1951	591	52
1952	603	61
1953	766	73
1954	534	26
1955	419	44
1956	646	55
1957	1084	74

We have received preliminary details of the results of fæces examination of persons in contact with a case of paralytic poliomyelitis in a London borough. The patient, a woman, was the first notified case (May 1, 1957) in the borough since February last (there had been 3 non-paralytic cases in children). The rest of the family had been ill with "colds" and "influenza" sixteen days before the mother was taken ill. In 2 of her 3 children, as well as a classmate of one of the children, virus was present in the fæces. The virus was still present twenty-eight days after the first examination. No other cases of poliomyelitis had so far been notified in that district up to June 17. House quarantine was not begun until after the result of the fæces examination of the children was known: before this, one of them had been to school.

Similar inquiries should help to clarify the value of close quarantine in poliomyelitis, a subject which is discussed in an annotation on p. 1290.

1. Teaching of Hygiene and Public Health in Europe: a Review of Trends in Undergraduate and Postgraduate Education in Nineteen Countries. By F. GRUNDY, professor of preventive medicine, Cardiff, and J. M. MACKINTOSH, professor of public health, London. With an introduction by JACQUES PARISOT. Geneva: World Health Organisation: Monograph series no. 34. 1957. Pp. 254. 25*s*. Obtainable from H.M. Stationery Office.

2. Prausnitz, C. Teaching of Preventive Medicine in Europe. London, 1933. See *Lancet*, 1952, ii, 951.

Influenza

Influenza virus isolated from a traveller lately arrived at the Hague has been sent to the World Influenza Centre in London. So far no spread has been reported in Holland. Reports reaching the World Health Organisation suggest that the virus responsible for the epidemic in Asia has also arrived in Australia and North America, but no outbreaks have developed.[1] The disease remains very mild. Viruses sent to the World Influenza Centre from Hong-Kong, Singapore, Kuala Lumpur, Australia, and Japan have all been antigenically alike, belonging to the new so-called Far Eastern variety of influenza A. The reported view [2] of Sir Macfarlane Burnet, director of the Walter and Eliza Hall Research Institute in Melbourne, is that the virus will spread throughout the world and that it will arrive in Britain when the cold weather comes.

Vaccine against the new type of virus has been prepared in the department of virus research in the Wright-Fleming Institute, St. Mary's Hospital, London.[3] The first batch will be tested soon.

1. *Times*, June 15, 1957.
2. *Ibid*, June 17, 1957.
3. *Ibid*, June 18, 1957.

Diary of the Week

JUNE 23 TO 29

Tuesday, 25th

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Mr. A. K. Monro: The Rôle of Surgery in Skin Diseases.

Wednesday, 26th

INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Mr. J. R. Belcher: Emphysematous Cysts of the Lung.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: Mycological Routine in Dermatology.

Thursday, 27th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
2.30 P.M. *Urology.* Dr. A. G. Lewis: Disturbances of Renal Physiology. Dr. F. M. Parson, Mr. R. Shackman: Uses of the Artificial Kidney.

POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
4 P.M. Dr. A. G. Macgregor: Hæmochromatosis.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. G. C. Wells: Keratinisation.

Friday, 28th

ROYAL SOCIETY OF MEDICINE
8.15 P.M. *Obstetrics and Gynæcology.* Dr. Francis Camps: Medico-legal Adventure and Misadventures in the Field of the Gynæcologist and Obstetrician.

POSTGRADUATE MEDICAL SCHOOL
10 A.M. Mr. Leon Gillis: Amputations.

Appointments

DAVIES, G. C., M.B. Wales, F.F.A. R.C.S.: consultant anæsthetist, Merthyr and Aberdare H.M.C.

REES, ELISABETH, M.D. Lpool: S.H.M.O. in venereology, United Liverpool Hospitals.

East Anglian Regional Hospital Board:

LAVY, G. A. D, M.B Camb., F.R.C.S.: surgical registrar, Norfolk and Norwich Hospital.

LUCKHOO, M. S. M.B. Aberd.: medical registrar, North Cambridgeshire and Clarkson Hospitals, Wisbech.

MANTELL, M. C. G., M.B. Camb.: anæsthetic registrar, West Suffolk General Hospital.

Obituary

MARINUS VAN DEN ENDE

M.B. Cape Town, Ph.D. Camb.

Prof. M. van den Ende, dean of the faculty of medicine in the University of Cape Town, died on June 4 at his home in Cape Town at the age of 45.

He was born in South Africa of a family of Dutch settlers, and he was educated at the University of Cape Town, graduating M.B. in 1933. Four years later he came to this country to take up a John Lucas Walker studentship in the department of pathology of the University of Cambridge, and in 1940 he was awarded the PH.D. Camb. Meanwhile, in 1939, he had joined the scientific staff of the Medical Research Council at the National Institute. D. G. E., one of his colleagues there, writes:

van den Ende was a born research-worker, both in the laboratory and in the field, with a highly critical mind and amazing energy; he seemed destined to reach the highest possible position. His researches during the war on cross-infection in hospitals and on typhus were quite outstanding. Perhaps his greatest achievement in England was the organisation of the laboratory at Frant for the large-scale production of scrub-typhus vaccine, exacting and dangerous work which he carried out with tremendous speed and success.

Although he was thoroughly at home in England, he never lost the desire to return to his own country, to which he had an intense loyalty, and in 1945 he accepted the chair in bacteriology at the University of Cape Town. In this new position he built up a large and active research school in virology and bacteriology and was able to show yet another quality, that of a teacher both of the research-worker and the undergraduate.

Apart from his ability as a scientist there were other qualities that will always first come to mind when thinking of van den Ende. He was a most lovable person with great charm, he was kind and generous almost to a fault and when, four years ago, he was tragically struck down by his fatal illness he faced the consequences with unbelievable courage, working fervently and relentlessly right to the end. Those of us who were with him during his time at Hampstead—which he often referred to as the happiest and most crowded period of his life—realise the great privilege we had in knowing such a man.

Prof. van den Ende leaves a widow, two sons, and two daughters.

ARTHUR CUBLEY

M.R.C.S.

Dr. Cubley, formerly deputy medical superintendent of the North-Eastern Fever Hospital of the London County Council, died on June 2, after a long retirement at Ashover, Derbyshire. He qualified from University College Hospital in 1900 and his whole career was spent in the fever service of the Metropolitan Asylums Board, and later of the L.C.C. W. E. S. writes:

Dr. Cubley was for long a well-known figure to all the medical staff of a service which was notable for its active inter-hospital social life. He had a kindly and unruffled bearing and was always ready to help his juniors from his great store of knowledge of the infectious fevers. His upright figure, deliberate speech, and large moustaches perhaps gave an impression more of the countryman than the doctor. He had a strong mechanical bent as shown by his invention of the Cubley tracheotomy tube, and he was a skilled woodworker.

He leaves a widow.

Dr. G. F. BUCHAN

C. M. S., a county M.O.H., recalls the one occasion on which he met Dr. Buchan.

In the early days of the war, when this county had some 40,000 evacuee women and children with all the related multifarious problems, we had many requests from the evacuation authorities to do this and to do that. The requests were all perfectly reasonable but nevertheless sometimes trying. There was a great sense of relief and contrast when one afternoon a tall distinguished man came into my office and introduced himself as Buchan of Willesden. "You have a large number of women and children from Willesden and you must be heavily pressed for health visitors. Can I send you some help?"

Notes and News

SMOKING AND LUNG CANCER

IN 1954 a group of tobacco manufacturers in the United Kingdom decided to contribute £250,000 towards research into the cause of lung cancer, and asked the Medical Research Council to apply this fund. A year ago the manufacturers set up a standing committee, with Sir Alexander Maxwell as chairman. Sir Alfred Egerton, F.R.S., and Sir Ronald Fisher, F.R.S., were appointed scientific consultants. The committee, which has now issued its first annual report, proposes to set up a new fund to promote research on any problem relating to smoking and health.

Mr. G. F. Todd, statistical adviser to the committee, has reviewed various statistical surveys in consultation with Sir Ronald Fisher. They criticise studies of the relationship between smoking and lung cancer on the ground that the material was not randomised, the smoking classes being self-selected. No studies have been made of the causes which determine whether a person will smoke. "It would be frankly incredible to assert that these smoking classes are not systematically differential, at least in respect of genotype, if not also in respect of environmental exposures not irrelevant to the subsequent incidence of cancer." If lung cancer were due to direct application of smoke to the bronchial epithelium, it should be commoner in those who inhale than in those who do not; but if it were due to a remote effect, then taking smoke into the mouth might be effective, and lung cancer would be as common in smokers who did not inhale. The latter explanation is consistent with the findings of Richard Doll and Bradford Hill, but L. Breslow and F. Lickint found higher percentages of inhalers among their lung-cancer cases than among their controls. If both direct application and a remote effect caused lung cancer, the lower mortality-rate in pipe smokers would be explained; but at least some increase in inhalers among lung-cancer patients would be expected.

Non-causal explanations of the statistical relationships are considered. A genetic factor might increase both the tendency to smoke and the liability to lung cancer. The increase would then be explained either by an environmental factor (such as the increase in oxidation products of hydrocarbons in the atmosphere) or by an increase of the numbers of persons surviving into the lung-cancer age-group who would, in previous eras, have died sooner and whose inherent resistance to lung cancer is lower than average.

The impossibility is noted of measuring the extent to which any individual is exposed to atmospheric pollution, and studies of the different prevalence of lung cancer in large and in small towns are criticised. Mr. Todd concludes that nobody can say how far the estimates linking lung-cancer mortality-rates with smoking or with atmospheric pollution are applicable to the whole population.

NEWS FROM KUALA LUMPUR

THE Institute for Medical Research at Kuala Lumpur in Malaya has published a report on its work for 1955—a heartening document. The list of papers covers work in microbiology, zoology, nutrition, and many other fields; and the collaboration between the institute and the U.S. Army Medical Research Unit continues to be fruitful.

The work on malaria continues, "but at a lower ebb from the diversion of resources to the more challenging problems of filariasis." That the pressure of the attack on malaria can be slackened is an indication of its success. The filariasis research unit, established in 1953, reports the discovery of sheathed microfilariæ in various local animals, but it is not yet known whether these are pathogenic to man. Diethylcarbamazine has been given to carriers with success. The same drug was given to the inhabitants of one kampong, while another kampong was sprayed with dieldrin, a residual insecticide; there was a striking decrease in the microfilaria rate and density in the drug-treated population, but in neither was there any reduction in the proportion of mosquitoes infected.

Much research has been done in virus and rickettsial diseases. Volunteers were immunised against typhus by a live vaccine with appropriately timed doses of chloramphenicol. 17 viruses (10 JE, 7 unidentified) have been isolated from 400,000 mosquitoes, and a dengue-like virus was found to be responsible for a third of the undiagnosed fevers at Kuala Lumpur General Hospital.

Research in nutrition includes the discovery of low thiamine levels in the milk of mothers of infants with acute respiratory

disease, suggesting that the lack may reduce the infant's resistance to infection. Of 238 severely anæmic patients, most were found to be iron-deficient, and in many there was a superimposed megaloblastic anæmia. Of 1200 patients whose stools were examined, hookworm infestation was much commoner in patients with a low hæmoglobin level, suggesting a cause for the high prevalence of iron deficiency.

These examples give some idea of the impressive scope and quality of the work in progress in Malaya.

EUROPEAN UNIVERSITY INTERCHANGE

A REPORT[1] by the Committee for Foreign University Interchange, whose chairman is Mr. F. W. D. Deakin, illustrates the value of university interchange as a means of promoting European understanding. The 551 visits which have been arranged under the interchange scheme between this country and other European countries during the past eight years have produced a total of 985 contacts between the participating European universities. In a foreword to the report, Sir James Mountford, vice-chancellor of Liverpool University and chairman of the Universities Advisory Committee of the British Council, declares that the cumulative effect of these schemes has resulted in a "really impressive number of academic contacts," and that "the learned world owes a debt to the work that has been done."

The scheme for the interchange of short visits lasting one to three weeks by university teachers, which is administered with the help of the British Council, came into operation in 1948 between the United Kingdom and Belgium and has since been extended to include Austria, Finland, France, Germany, Iceland, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and Yugoslavia. Each year 63 visits are made each way between these countries, and in the course of the current year there are plans to extend the scheme still further by the inclusion of Denmark, Turkey, and Poland.

The report describes a supplementary scheme, arranged between the United Kingdom, Belgium, France, Germany, and Yugoslavia, for assisting younger research-workers to further their investigations by personal contact with others working in the same field abroad. Belgium, France, Germany, and the United Kingdom also plan to introduce in the next academic session a new scheme for the exchange of longer teaching visits of one term or semester.

In the field of postgraduate scholarships, 684 students from the Continent have been given awards by the British Council for study in the United Kingdom, whilst 549 British students have been helped by foreign governments or universities to study on the Continent. The report also refers to the growing number of awards offered by such bodies as the Council of Europe, the High Authority of the European Coal and Steel Community, UNESCO, and NATO, and the interest shown by Western European Union in fostering coöperation between the universities of Europe.

ELECTRICAL INCUBATORS

A REPORT to the East Anglian Regional Hospital Board[2] has drawn attention to the potential dangers of electrical incubators. The report arose from a baby's death owing to overheating from an electrical fault, and it instanced several other cases where babies had been at risk.

A draft British standard for electrically heated incubators and cots for babies has now been produced. The adoption of this standard will eventually go far towards eradicating the dangers of incubators. In fairness to the manufacturers it should be remembered that accidents have been extraordinarily few, although in the past ten years very many babies have been nursed in incubators. Trouble may sometimes have been due to lack of servicing and overhaul; hospital attendants and junior nursing staff are not always as gentle as they should be when moving and cleaning incubators; and it seems likely that in some hospitals out-of-date amateur-built incubators, and incubators made as prototypes by firms not ordinarily engaged in building incubators, may still be in use. These may be dangerous, and they should not be retained even for occasional use in a hospital where an incubator is rarely required.

1. University Interchange between the United Kingdom and other European Countries. A report on the work of the Committee for Foreign University Interchange. Issued by the British Council, 65, Davies Street, London, W.1.
2. *Cambridge Daily News*, May 16, 1957.

A GENTLEMAN'S LIBRARY

To buy books is always a pleasant hobby; to buy them for a definite purpose on a limited budget is also a skilled occupation. Some fifty years ago Arnold Bennett in *Literary Taste* offered the man of modest means a useful guide to the books needed for a reasonably complete library of English literature. His basic list included 562 volumes at a cost of £87 18*s*. 6*d*. In our more specialised (and expensive) days, Dr. Iago Galdston, secretary of the medical information bureau of the New York Academy of Medicine, is seeking the help of his colleagues on both sides of the Atlantic in a more limited venture—though the cost will be about the same. If you had no more than £80–90 to spend, what books, Dr. Galdston asks, would you buy to form a modest working library on medical history? His putative readers have apparently studied only modern languages; for though the library may include books written in French, German, and Italian, he adds "We can count on very few who have a competence in either Latin or Greek." Lists of suggestions should be sent to Dr. Galdston at the Academy, 2, East 103 Street, New York 29, N.Y.

NEW FILMS

Nutrition in Pregnancy (16 mm., sound, colour, 11 minutes, Great Britain, 1957) is designed to advise expectant mothers on diet both in the antenatal period and while breast-feeding the baby.

Emphasising that an adequate diet is the best foundation for the life of the baby, the film discusses the body's need of carbohydrates, fats, proteins, minerals, and vitamins and the foods that contain them. The film consists of a talk illustrated throughout by animated diagrams. Though well drawn, these tend to be fussy, and the emphasis on dietary constituents is less helpful to a mother than suggested menus and recipes. A lot of information is given in the film, and this might have been better presented as an illustrated article or pamphlet.

The film is available free from the Nutrition Information Centre, Vitamins Ltd., Upper Mall, London, W.6.

Line of Defence, the third film of a series shown on B.B.C. television recently, dealt with the international control of infectious diseases.

A passenger from Asia, where there has been a recent outbreak of smallpox, develops spots which, though resembling those of chickenpox, are sufficiently atypical to make the ship's surgeon suspicious. Through the World Health Organisation at Geneva, the port of London health authority is warned and the routine procedure on ship and ashore is shown. While the efficiency of the international organisation was well conveyed, the detail lacked balance, such aspects as the differential diagnosis between variola and varicella by microscopy, egg inoculation, and serum methods being shown at considerable length whereas the routine procedure as it affected the other passengers and crew of the ship was barely touched on.

THE LIVER

THE choice of subject for the second number of the *British Medical Bulletin* for this year[1] is timely in view of the many recent advances in our knowledge of the liver in health and disease. The topics which have been selected for review cover a wide field, and will interest both physiologist and clinician.

In his introduction, Sir Harold Himsworth, F.R.S., emphasises that study of neither the normal alone nor the abnormal alone can supply the full information required for the comprehension of either. Progress depends on our ability to integrate the knowledge gained on the two sides. In the case of liver disease, the work which linked protein and fat metabolism with experimental liver injury was the stimulus which led to the development of much recent research. In this respect, the article by J. C. Waterlow and G. Bras on nutritional liver damage is especially interesting. They point out that in man the only example of a direct effect of diet is the fatty liver of kwashiorkor. In this condition recovery, both structural and functional, is the rule and earlier suggestions that the fatty change led on to cirrhosis cannot now be substantiated. The rôle of protein deficiency in the development of permanent hepatic disease in underdeveloped countries is difficult to determine, but possibly malnutrition may have an indirect effect on the liver and predispose it to injury by other harmful agents.

The place of protein in the dietary treatment of diffuse liver disease is becoming more clearly defined. In acute hepatitis, J. F. Stokes and M. L. Rosenheim suggest an intake of about 100 g. protein per day, and they remark that the advantages of a higher protein content are not clearly established. In patients with ascites secondary to hepatic cirrhosis a high-protein diet is often beneficial, provided that no neurological complications ensue. The mechanism of the

1. The Liver: Some Physiological and Clinical Aspects. *Brit. med. Bull.* May, 1957, 13, no. 2. 20*s*.

development of neuropsychiatric changes in liver failure is ably reviewed by Sheila Sherlock. The condition depends on the absorption of nitrogenous material from the intestine, and in the acute stage it is essential to stop all dietary protein. The liver has a remarkable ability to replace lost tissue, and the question of the stimulus to regeneration presents a fascinating and fundamental problem, which is discussed by R. D. Harkness. Here again, protein may play a part, for there is some evidence that a fall in the protein concentration in the immediate environment of the hepatic cells may be responsible for setting in motion the regeneration of new tissue after partial hepatectomy. Other features of protein metabolism are considered in several of the articles which make up this number. In addition, many other aspects of hepatic function and disease are reviewed. This admirable symposium can be recommended to all interested in recent progress in the study of the liver.

University of Oxford

On June 8 the degree of D.M. was conferred on John Swithinbank.

University of London

On May 22 the following degrees were conferred:

M.D.—Eunice Lockey, John Newsome.
M.S.—Kenneth Owen.

Royal College of Surgeons of England

At a meeting of the council on June 13, with Sir Harry Platt, the president, in the chair, Lord Webb-Johnson, past president, was admitted as a member of the court of patrons.

The following were coöpted to the council for the year 1957–58, representing various branches of practice:

Dr. John Hunt, general practice; Mr. A. C. H. Bell, gynæcology and obstetrics; Mr. G. Gill-Carey, otolaryngology; Dr. Frankis T. Evans, anæsthetics; Mr. A. B. Nutt, ophthalmology; Dr. E. Rohan Williams, radiology.

The Hallett prize was awarded to Dr. R. Y. Calne, of Guy's Hospital Medical School.

A gift under covenant which will produce £45,000 was received from Cerebos Limited.

Diplomas of fellowship were granted to the following:

J. W. Garraway, W. J. L. Harries, E. J. Hargadon, M. D. Lord, W. K. M. C. Watkins, G. R. Benett, P. S. Watson, D. H. Nixseaman, George Kazantzis, B. L. Whitaker, M. W. F. Dunning, H. E. D. Griffiths, H. B. Eckstein, P. E. Huddy, †R. A. Williams, P. H. E. Courtenay, Peter Goodall, J. W. Goodfellow, G. P. C. Orlay, Katharine M. Fussell, Ernest Kirz, C. R. Griffin, B. T. Hammond, †R. V. Tracy Forster, Anant Charan, Gobindadas Goswam. Anand Mohan Ahuja, † G. O. Clark, Muneer Husain, N. K. G. Mendis, †R. K. Roddie, D. D. Beard, J. H. Hodgson, A. R. Kirby, Mary K. Marchant, †A. W. Morrison, Mihir Kumar Senapati, C. V. Wijesinha, J. A. Wilkinson, Nabil Ahmed Allouba, A. G. Bond, †B. W. M. Bushell, Abdul Karim Chaudhry, Hansa Deva Perera Goonatillake, G. A. D. Lavy, B. K. Madden, Ariyaman Mahanama Mendis, Bernard Nolan, G. J. Smart, Oliver Wesley-James, Elliott Bader, Ranjit Basu, R. G. K. de Castro, M. H. Flint, J. R. W. Gleave, *P. A. Graham, Syed Zafar Haider, C. D. Levis, I. J. MacQueen, Salil Kumar Mukhopadhyay, Durgadas Sengupta, Dhirajlal Chhelshanker Vora, B. M. Andrea, Shyam Kishinchand Bulchandani, Kedarnath Vasudeo Chaubal, Harold Collinson, K. B. Cornwell, †Israr Hasan Jafri, Adrian Litton, J. R. McQuaide, G. M. Nunn, *Ramachandra Pararajasegaram, Rasikbhai Ambalal Patel, J. P. Richardson, A. G. G. Robson, Norman Samuels, Brahma Dutt Sharma, Kedar Nath Sharma, Thomas Stack, Henry Sunderland, J. G. Sweeney, Cyril Toker, R. O. Wise, F. C. O. Allen, J. R. Badger, K. S. Brearley, Madhav Ranchandra Chaudhary, H. J. Done, H. L. Duthie, W. J. Eskdale, R. K. Greenwood, R S M. Ling, D. C. Mackenzie, B. R. Meyerowitz, J. F. Newcombe, Ishwarbhai Chaturbhai Patel, V. M. Rao, Fardoon Phiroze Soonawalla, D. W. Whiteway, C. A. Cass, Jean A. Evans, †V. T. Hammond, N. J. Jackson, P. R. Knight, Peter Knipe, A. B. Oliveira, Ratan Chandra Varma, John Ludbrook.

* In ophthalmology. † In otolaryngology.

A diploma of membership was granted to M. B. Rees-Jones.

Royal College of Physicians of Ireland

At a meeting of the college on June 7 with Dr. F. J. O'Donnell, the president, in the chair, the following were admitted to the fellowship:

W. A. Gillespie, M. E. Cheffins, J. D. Kennedy, D. J. O'Callaghan, and H. B. Kelly (in absentia).

The following were admitted as licentiates and members:

J. P. Alexander, Thomas Haran, B. J. Demass, and J. R. McCarthy.

National Institute of Mental Health, Washington

Dr. J. J. Elkes is resigning the chair of experimental psychiatry in the University of Birmingham on his appointment as head of the clinical neuropharmacology research centre of this institute.

Lebanon Hospital

The annual meeting of this hospital will be held on Thursday July 4, at 5 P.M., at the Cora Hotel, Upper Woburn Place, London, W.C.1. The Earl of Feversham will be in the chair, and the speakers will include Prof. Alexander Kennedy.

Biochemistry Society

A meeting of this society will be held in the department of chemistry of King's College, Newcastle upon Tyne, on Friday, June 28, at 11.15 A.M. On Saturday, June 29, at 11 A.M. the society will hold a joint meeting with the Association of Clinical Biochemists when the programme will include a symposium on mucoproteins.

Oxford Graduates' Medical Club

The summer dinner of this club will be held in Trinity College, Oxford, on Friday, July 5, at 7.30 P.M., when Dr. Maurice Campbell will be in the chair. Members may bring medically qualified guests of either sex. Tickets (37*s.* 6*d.*) may be had before June 28 from Dr. Ronald Macbeth, department of otolaryngology, Radcliffe Infirmary, Oxford.

Service Awards

On the occasion of the Queen's birthday, in recognition of distinguished services in the Near East, October to December, 1956, the following doctors received awards:

M.C.—Captain John Malcolm Elliott, M.B. Birm., R.A.M.C.
Mention in despatches.—Surgeon Lieutenant John Gwythar Bradford, M.B. Lond., R.N., 45 Commando, Royal Marines; Surgeon Lieutenant Peter Gordon Harries, M.B. Lond., R.N., H.M.S. *Diana.*

Lady Tata Memorial Fund

For research on leukæmia and allied diseases, in the year beginning October, the trustees of this Fund have made the following awards:

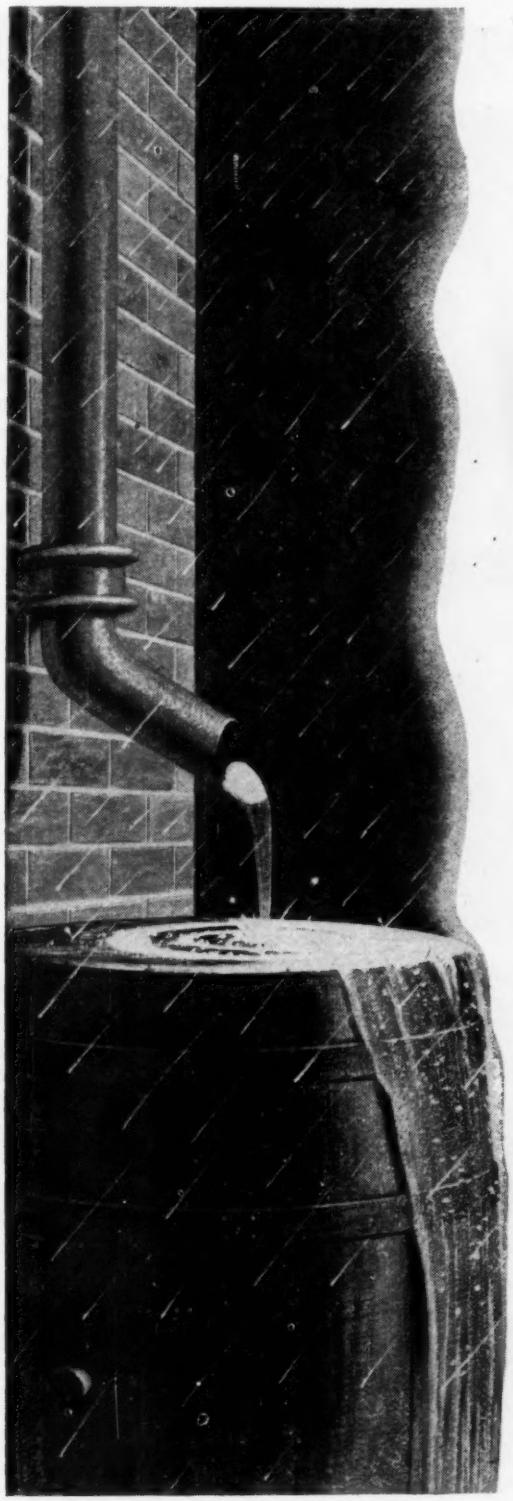
Grants for Research Expenses.—Dr. J. Kieler (Denmark), Fibiger Laboratory; Dr. M. Seligmann (France), Institute Pasteur; Dr. M. Simonsen (Denmark), Fibiger Laboratory; Dr. B. Thorell (Sweden), Karolinska Institute; Dr. G. Klein (Sweden), Karolinska Institute; and Dr. M. Bessis (France), Centre National de Transfusion Sanguine.
Scholarships.—Dr. G. Marinone (Italy), University of Pavia, and Dr. A. J. Therkelsen (Denmark), Institute of General Pathology.
Scholarship and Grant.—Dr. G. V. Seaman (England), Department of Colloid Science, Cambridge.

Ross Institute of Tropical Hygiene

At a luncheon held at the London School of Hygiene and Tropical Medicine on June 12 to mark the centenary of Sir Ronald Ross's birth, Sir Eric Macfadyen, the chairman, recalled that the establishment of the institute named after Ross was mainly due to the efforts of the late Sir William Simpson and the late Sir Malcolm Watson; and Austin Chamberlain had been mainly responsible for the institute's incorporation with the London School of Hygiene and Tropical Medicine. Dr. M. G. Candau, director-general of W.H.O., spoke of the Organisation's debt to Ross, who, forty-five years before the introduction of D.D.T., established the principles that were now being followed in programmes of malaria eradication. In May, 1955, W.H.O. had decided to support steps towards achieving world-wide eradication of this disease. By the end of March this year 63 countries and territories had accepted eradication as a goal; in 10 this had been almost achieved, while in 15 the work was well advanced. Mortality and morbidity attributable to malaria were now at levels not more than a third of those twelve years ago when the attack with residual insecticides was begun. Prof. G. Macdonald, director of the institute, recalled that it was Dr. Candau's powerful advocacy which led the World Health Assembly in 1955 to decide on a policy of eradication. Turning to the work of the institute, he said that this comprised advisory and consultative services, teaching, and research. Research was being directed towards the reasons for the prevalence of malaria, and the resistance of anopheles to insecticides.

On June 10 Prof. J H. Burn, F.R.S., received the honorary D.SC. of Yale University.

CORRIGENDUM: *Harvey Tercentenary.*—In our report last week (p. 1237) of the Harvey Tercentenary Conference we misrepresented Prof. K. J. Franklin's remarks. Fabricius of Padua first noticed that valves are a feature of many (not *all*, as we stated) veins of the body in 1574; his book, however, was not published until 1603. Harvey was a fellow of the College of Physicians of London. The epithet "Royal" was not added until towards the end of the 17th century, and then far from invariably.



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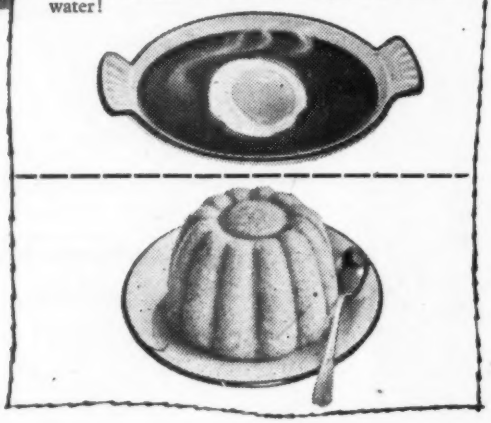

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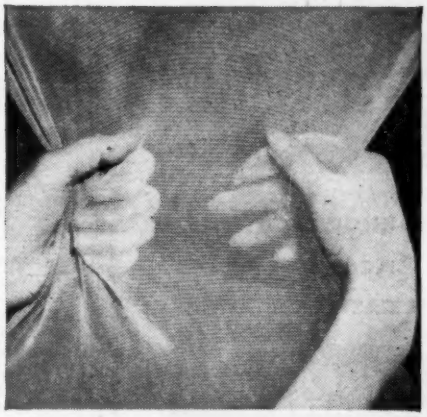

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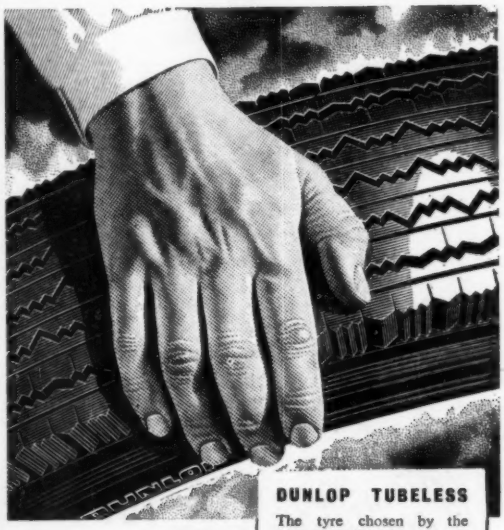

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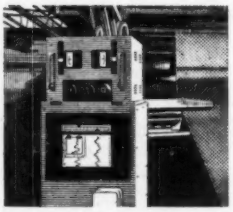

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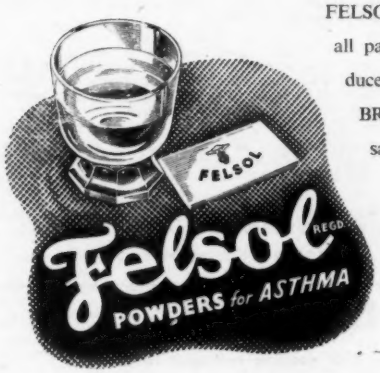

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Academic and Educational

UNIVERSITY OF BRISTOL

DIPLOMA IN PUBLIC HEALTH—SESSION 1957–58

A FULL-TIME COURSE of instruction covering 3 academic terms will commence in OCTOBER.

The fee for the full Course is £66.

Application forms may be obtained from The Department of Medical Postgraduate Studies, The University, Bristol, and should be lodged as soon as possible.

SOCIETY OF APOTHECARIES OF LONDON

DIPLOMA IN INDUSTRIAL HEALTH

The next Examination will begin on MONDAY, 1ST JULY, 1957. The following Examination will be held in December, 1957.

For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

ST. BARTHOLOMEW'S HOSPITAL, London, E.C.1. 15 MeV LINEAR ACCELERATOR RESEARCH UNIT—FELLOWSHIP. Applications are invited from registered medical practitioners, with experience in hæmatology and morbid histology, for a Fellowship of 2 years duration for work in connection with high voltage radiation. Salary £1500 p.a., plus superannuation.

Applications, enclosing the names of 3 referees, should be sent to the Clerk to the Governors, within 28 days of the date of this advertisement.

THE MEDICAL COLLEGE OF ST. BARTHOLOMEW'S HOSPITAL, West Smithfield, E.C.1. Applications are invited for the post of JUNIOR LECTURER IN PHARMACOLOGY, tenable as from 1st August, 1957, or as soon after as possible. The salary is on a scale of £850–£50–£1050 together with a London allowance of £60, children's allowance and membership of the F.S.S.U. The successful candidate will participate in the teaching of medical students and in the research work of the Department.

Applications, which should be received not later than 5th July, 1957, should be addressed to the Dean of the Medical College, from whom further particulars may be obtained.

THE UNIVERSITY OF LIVERPOOL. Applications are invited for the post of ASSISTANT LECTURER in the Department of Physiology. The salary scale for a medically qualified candidate will be £900–£100–£1100 p.a. (initial salary £900 p.a.); the salary range for a non-medically qualified candidate will be £700–£850 p.a.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be received not later than 13th July, 1957, by the Registrar, from whom further particulars of the conditions of appointment may be obtained.

UNIVERSITY OF ABERDEEN. Applications are invited for the following posts :—

1 LECTURESHIP IN PATHOLOGY, Scale (*c*) or Scale (*b*).

2 LECTURESHIPS IN PATHOLOGY, Scale (*b*) or Scale (*a*).

Salaries on revised scales operating after 1st August, 1957, expected to be :—

Scales (*a*) and (*b*) in range £900–£1900.

Scale (*c*) £2050–£2450.

F.S.S.U. and children's allowance.

Particulars from the Secretary, The University, Aberdeen, with whom applications (8 copies) should be lodged not later than 11th July, 1957. Applicants outside the British Isles may submit 1 copy.

UNIVERSITY OF EDINBURGH. Department of Pathology. Applications are invited for the post of LECTURER in the Department of Pathology. The present salary scale, which will be revised at 1st August, 1957, is £700–£100–£1100 p.a., with superannuation benefit and family allowance where applicable.

Further particulars may be obtained from the undersigned, with whom applications giving the names of 2 referees, should be lodged not later than 15th July, 1957.

CHARLES H. STEWART, Secretary to the University.

June, 1957.

UNIVERSITY OF EDINBURGH. Department of Surgical SCIENCE. Applications are invited from graduates in medicine holding a higher surgical qualification for the post of LECTURER (whole-time) in the Department of Surgical Science. The present salary scale, which will be revised at 1st August, 1957, is £1200–£100–£1600 p.a., with superannuation benefit and family allowance where applicable. The Lecturer will be expected to devote a substantial part of his time to research in the Wilkie Laboratory, and his duties will also include teaching with clinical practice in the Royal Infirmary of Edinburgh. The Regional Board will grant the honorary status of Senior Registrar.

Further particulars may be obtained from the undersigned with whom applications giving the names of 2 referees, should be lodged not later than 3rd July, 1957.

CHARLES H. STEWART, Secretary to the University.

June, 1957.

UNIVERSITY OF GLASGOW. Applications are invited for a LECTURESHIP IN BACTERIOLOGY. Salary according to placement on University scale for clinical teachers. The final maximum is £1750 p.a. F.S.S.U. and family allowance benefits.

Applications (12 copies) should be lodged, not later than 31st July, 1957, with the undersigned, from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

THE SHUTE INSTITUTE, London, Ontario, Canada. A Clinic specialising in cardiovascular disease, obstetrics and gynæcology. Applications are invited for a post in Cardiology, commencing at once. Higher qualifications desirable but not essential. The appointment will be for 1 year in the first instance. Salary $9000 for the first year, with subsequent review.

Applications, accompanied by photograph, stating age, qualifications, nationality, should be forwarded to the Medical Director of the Shute Institute, London, Canada.

UNIVERSITY OF SASKATCHEWAN, Canada. Department of SURGERY. Required, RESEARCH FELLOW to work in the Surgical Research Laboratories. Appointment for 1 year or longer if desired. Candidates should have had at least 1 years postgraduate training. The successful candidate may apply to join the Resident Staff of the University Hospital in the year following his research appointment. This appointment is recognised for training for the Fellowship of the Royal College of Surgeons of Canada. Salary $2400–$3600 p.a. according to experience.

Write Professor of Surgery, University Hospital, Saskatoon, Saskatchewan, Canada.

UNIVERSITY COLLEGE OF THE WEST INDIES. Applications are invited for LECTURESHIP IN SURGERY. Salary scale £1100–£100–£1500–£100–£1900 p.a. Entry point determined by qualifications and experience. Child allowance. F.S.S.U. Unfurnished accommodation if available at 5% of basic salary or allowance in lieu. Passages for up to 5 persons on appointment, normal termination and study leave (once every 3 years). Duties to be assumed by 1st September, 1957, or as soon as possible thereafter.

Detailed applications (10 copies), naming 3 referees, by 22nd July, 1957, to Secretary, Senate Committee on Colleges Overseas in Special Relation, University of London, Senate House, London, W.C.1, from whom further particulars may be obtained.

Hospital Services : Senior Appointments

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL, S.E.5. The Board of Governors invite applications for the post of Whole-time CONSULTANT PATHOLOGIST. Vacancy arises from the upgrading of a Senior Hospital Medical Officer post, the holder of which will be a candidate for the higher position.

Applications (10 copies), giving curriculum vitae and the names of 3 referees, should be sent to K. J. JOHNSON, House Governor and Secretary, The Bethlem Royal Hospital and the Maudsley Hospital, Denmark-hill, S.E.5, not later than 20th July, 1957.

MIDDLESEX HOSPITAL, W.1. Applications invited for the post of ASSISTANT in the Department of Radiotherapy with salary on the scale £1653 15s.–£2126 5s.

Further particulars obtainable from the Deputy Superintendent, to whom applications should be sent, naming 2 referees, by 6th July.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) ASSISTANT CHILD PSYCHIATRIST (Senior Hospital Medical Officer grade), 2 half-days a week (1 day), Hertfordshire Child Guidance Service. Candidates may visit by appointment with the Medical Director, Child Guidance Clinic, Hill End, St. Albans.

Applications before 22nd July, 1957.

(2) CONSULTANT SURGEON, Northwood, Pinner and District Hospital, Northwood, Middlesex (36 Beds), 1 half-day a week.

Applications before 29th July, 1957.

(3) CONSULTANT PHYSICIAN in Physical Medicine (whole-time), Edgware General Hospital, Edgware, Middlesex (638 Beds), for 9 half-days a week, and National Temperance Hospital, Hampstead-road, N.W.1 (158 Beds), for 2 half-days a week.

Applications before 31st July, 1957.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. BERNHARD BARON MEMORIAL RESEARCH LABORATORIES, QUEEN CHARLOTTE'S MATERNITY HOSPITAL. Applications are invited for a BIOCHEMIST to be responsible for the routine chemical pathology of the hospital and to initiate and undertake a programme of research. The position is open to medical (up to and including Consultant grade) or non-medical (up to and including top grade Biochemist) applicants and further information may be obtained from the Director of the Laboratories.

Applications, giving details of age, qualifications and experience, with the names of 3 referees, should be sent to the House Governor, 339, Goldhawk-road, London, W.6, by 1st August, 1957.

BROMLEY GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum RADIOLOGIST (Senior Registrar grade or above) required for 6 daily sessions a week from 22nd July to 10th August.

Apply Group Secretary, Farnborough Hospital, Kent.

CHELMSFORD, ESSEX. BROOMFIELD HOSPITAL. Required, experienced Locum Tenens SENIOR HOSPITAL MEDICAL OFFICER for long period, full residence or only when on duty. Unit has 312 Beds for the treatment of pulmonary tuberculosis in adults. Tuberculous and non-tuberculous thoracic surgery, chest clinics, and mass radiography.

Apply Physician-Superintendent.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time Locum ANÆSTHETIST (Senior Hospital Medical Officer) required for the Rochdale Group of hospitals. Resident or non-resident. Salary £34 14s. 6d. per week.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time Locum RADIOLOGIST (Consultant or Senior Hospital Medical Officer). Duties mainly at Scarborough Group of hospitals. The appointment would be for an initial period of 3 months subject to further extension.

Applications, stating age, qualifications, and details of appointments held showing dates, together with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, as soon as possible.

LEEDS REGIONAL HOSPITAL BOARD.
Part-time CONSULTANT in Obstetrics and Gynæcology (7 notional half-days per week) for duties at hospitals in the East Riding of Yorkshire (mainly at Beverley and Driffield). The person appointed to reside in Beverley.

Maximum Part-time CONSULTANT in Radiology for duties at hospitals in Scarborough, Bridlington, and Malton. The person appointed to reside in Scarborough.

Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer scale) for duties at Clifton Hospital, York (1112 Beds), and associated clinics at Harrogate, York, and Scarborough. The person appointed may also have duties at Claypenny Hospital for Mental Defectives (1 session per week). Small flat available.

Applications (12 copies), stating age, qualifications, and details of present and previous appointments with dates, and names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 9th August, 1957.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade), at Craig Dunain Hospital, Inverness. House available.

Forms of application and further particulars may be obtained from the undersigned with whom applications should be lodged by 12th July, 1957. A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Locum Tenens RADIOLOGIST (Consultant or Senior Hospital Medical Officer), whole- or part-time, for duty in hospitals in Fife for the month of August.

Apply, giving qualifications and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 29th June.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Ophthalmology, PERTH AREA. Applications are invited for the post of ASSISTANT OPHTHALMOLOGIST in the area covered by the County and City of Perth General Hospitals Group (main hospitals—Perth Royal Infirmary, 272 Beds, and Bridge of Earn Hospital, 806 Beds), including Local Authority Clinics in Perth and Perthshire. The appointment will be on a whole-time or maximum part-time basis in the option of the successful candidate. Salary (whole-time) £1653 15s.–£52 10s.–£2126 5s. p.a.

Forms of application and further particulars from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 13th July, 1957.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

CONSULTANT E.N.T. SURGEON at the Western Infirmary, Glasgow. The appointment will be part-time on the basis of 9 sessions per week.

Whole-time ASSISTANT RADIOLOGIST at the Western Infirmary, Glasgow. Salary (at age 32 and over) on the scale £1653 15s.–£52 10s.–£2126 5s.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Consultant General Surgeon (maximum part-time) required for hospitals in the Boston Area.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 13th July, 1957.

ST. HELENS. PROVIDENCE HOSPITAL. Applications invited for the post of HONORARY ASSISTANT CONSULTANT RADIOLOGIST at above Hospital. The Hospital has 125 Beds and an Outpatients Department and the appointment will be for 2 notional half-days per week.

Applications, giving full details of qualifications and experience and names and addresses of 2 referees, should be forwarded to undersigned not later than 29th June, 1957.
WILLIAM I. LIVESEY, Honorary Secretary.
Providence Hospital, St. Helens.

WELSH REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST, North Wales Hospital, Denbigh (1512 Beds, admission-rate over 1100). Applicants must have had wide experience in psychiatry, hold the D.P.M. and, preferably, a higher qualification in medicine ; should be competent to take full clinical responsibility in this Hospital, and to participate in the Domiciliary Consultant Service in the 5 North Wales Counties and in the outpatient clinics held in the major general hospitals in the area. Non-resident.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens CONSULTANT (general surgery) required Barry Accident Hospital, 26th August–23rd September, 1957.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

U.S.A. VIRGINIA. Progressive State mental hospital in Virginia, 4600 Beds, expanding staff, invites applications for PHYSICIANS at all levels, psychiatric experience desirable but not necessary. Salary from $8040 (approximately £2750). All modern methods of treatments. Opportunities for research. Good retirement plan.

Apply to JUUL C. NIELSEN, M.D., Superintendent, sending full résumé in first letter to Box 271, Petersburg, Virginia, U.S.A.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as CONSULTANT CLINICAL PATHOLOGIST whose headquarters will be at the laboratory at Tyrone County Hospital, Omagh. The successful applicant will also take charge of the laboratory at Fermanagh County Hospital, Enniskillen, and will be responsible for providing a pathological service to hospitals and general practitioners in the Tyrone and Fermanagh area. The terms and conditions of the appointment will be in accordance with the Authority's application to Northern Ireland of the Spens report.

Application to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned so as to be received not later than 6th July, 1957.

Hospital Services : Junior Appointments

ACTON HOSPITAL, Gunnersbury-lane, W.3. Senior HOUSE OFFICER (casualty) required for 1 year from 28th June, 1957. Resident post.

Applications to Hospital Secretary within 7 days.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. HOUSE SURGEON (resident), vacant 24th July, 1957. Open to registered practitioners and pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials.

BROMPTON HOSPITAL, S.W.3. Applications invited for post of SURGICAL REGISTRAR (whole-time). The appointment is for 1 year with eligibility for reappointment. Candidates must hold the Diploma of F.R.C.S.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 6th July, 1957, to KENNETH A. F. MILES, House Governor.

BROMPTON HOSPITAL, S.W.3. Applications invited for post of NON-RESIDENT HOUSE PHYSICIAN for 9 months from 1st September, 1957. Duties include work in Outpatient Department, wards, Cardiac and E.N.T. Departments. Salary at the rate of £577 10s. p.a.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 6th July, 1957, to—
KENNETH A. F. MILES, House Governor.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. SENIOR HOUSE OFFICER (resident) required in Anæsthetics Department. Whole-time appointment for 6 months. Renewable. Post now vacant. Previous experience in anæsthesia essential. Post recognised for the D.A. and F.F.A.R.C.S.

Applications, with copies of 2 testimonials or names of 2 referees, to Medical Director by 29th June.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICERS required in Surgical Department. Posts vacant August, 1957.

Applications, with 2 testimonials, to Medical Director by 29th June.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER (post-registration) required in Gastroenterological Department. Appointment from 1st August, 1957.

Applications, with 2 testimonials, to Medical Director by 29th June.

CHARING CROSS HOSPITAL, W.C.2. Full-time Resident GYNÆCOLOGICAL AND OBSTETRIC REGISTRAR. Grade : Registrar. To commence as soon as possible for 1 year in the first instance, with eligibility for re-election.

Application forms from the undersigned to be completed and returned by 8th July, 1957.
FRANK HART, Secretary to the Board.

No. 4 (CHELSEA) GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Part-time REGISTRAR in Department of Physical Medicine for duty on a 2-sessional basis at the Centre for Spastic Children, S.W.3.

Application forms from the Group Secretary, St. Luke's Hospital, Sydney-street, London, S.W.3.

CHILD GUIDANCE TRAINING CENTRE, 6, Osnaburgh-street, London, N.W.1. The following vacancies will occur on 1st October, 1957, for PSYCHIATRIC REGISTRARS in training.

1 full-time post.
1 part-time post (5 sessions per week).

Whitley Council conditions and salary. Preference given to applicants intending to specialise in child guidance. Previous psychiatric experience essential. Appointments for 1 year in first instance, renewable for 1 additional year. Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Group Secretary, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 3rd July, 1957.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for the post of SECOND CASUALTY OFFICER with duties in the Department of Orthopædic and Traumatic Surgery (Senior House Officer grade). Recognised for F.R.C.S. Salary £819 10s. p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

FULHAM HOSPITAL, St. Dunstan's-road, Hammersmith, W.6.
HOUSE SURGEON (2 vacancies). Provisionally registered candidates eligible. Appointments recognised for F.R.C.S.
HOUSE PHYSICIAN (3 vacancies). Provisionally registered candidates eligible.

Appointments commence 1st August, 1957, are resident, and are limited to 6 months.

Applications by 5th July, 1957, on forms obtainable from the Hospital Secretary. (L.40.)

GORDON HOSPITAL, Vauxhall Bridge-road, S.W.1. WESTMINSTER HOSPITAL TEACHING GROUP. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade) for 1 year in the first instance, starting early in August.

Applications (3 copies), with the names of 2 referees, should be sent to the Secretary, the Gordon Hospital, within 1 week of the appearance of this advertisement.

GUYS-MAUDSLEY NEUROSURGICAL UNIT. Applications are invited for the post of REGISTRAR for 1 year, commencing 1st October, 1957. The unit, which is housed in the Maudsley Hospital, serves Guy's Hospital, and the Bethlem Royal Hospital and the Maudsley Hospital.

Applications should be made before 15th July, 1957, to K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark-hill, S.E.5.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications for the 6-months resident appointment, from 1st August, of pre-registration HOUSE SURGEON (recognised for F.R.C.S.) should reach the Secretary, above address, by 8th July, quoting HH/PHS.

KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.5. Applications are invited for the post of REGISTRAR in Obstetrics and Gynæcology. The appointment will be from 1st October, 1957, to 30th September, 1958, for 1 year in the first instance, but will be subject to reappointment.

Applications, stating age, education, qualifications and experience, with the names of 2 referees, should be sent to the undersigned by 6th July, 1957.

S. W. BARNES, House Governor.

KING'S COLLEGE HOSPITAL BOARD OF GOVERNORS, Denmark-hill, S.E.5, AND THE SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in Radiology (diagnostic), to be made jointly by the bodies concerned, the post to be held at King's College Hospital and in the Woolwich Hospital Group. Applicants should hold a higher qualification in radiology. The successful candidate will be expected to spend part of his time in the Regional Board Hospital on an exchange basis. The appointment, which is renewable annually, will be tenable for a 4-year period, commencing 1st October, 1957, but it is hoped that the successful applicant will take up his duties on 1st July, 1957.

Applications, stating age, education, and qualifications and experience, and giving the names of 2 referees, should be sent to the undersigned not later than 6th July, 1957.

S. W. BARNES, House Governor.

KING EDWARD MEMORIAL HOSPITAL, Ealing. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (Resident Surgical Officer), vacant now. Experience in general surgery essential and holding of F.R.C.S. an advantage. Post recognised for F.R.C.S. examination.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 2nd July.

KING EDWARD MEMORIAL HOSPITAL, Ealing. SENIOR HOUSE OFFICER required 17th July at King Edward Memorial Hospital, for duty in Casualty and Fracture Departments. Recognised for 6 months casualty work for F.R.C.S. examinations. Resident at Clayponds Wing, South Ealing, and responsible for beds there.

Applications, stating age, nationality, qualifications and experience with dates, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 2nd July.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the post of RESIDENT HOUSE SURGEON, vacant on 23rd July, 1957. The successful candidate will be required to carry out a fortnight's Locum duty commencing 9th July, 1957. Recognised for the F.R.C.S.

Application forms from the acting Physician-Superintendent.

MEMORIAL/BROOK GENERAL HOSPITAL, Shooters Hill, Woolwich, S.E.18. HOUSE PHYSICIAN (pædiatrics and infectious diseases), vacant mid-July. Not pre-registration. The post is recognised for D.C.H. and entails routine ward and outpatient work, including experience in the modern Infectious Diseases Unit and with neonates.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

MIDDLESEX HOSPITAL, W.1. Applications invited for non-resident post of SENIOR HOUSE OFFICER in the Department of Physical Medicine and Rheumatism.

Rules and application forms obtainable from Deputy Superintendent should be returned, naming 2 referees, by 6th July.

MILDMAY MISSION HOSPITAL, Austin-street, London, E.2. Applications are invited for the pre-registration post of RESIDENT HOUSE PHYSICIAN AND CASUALTY OFFICER, vacant on 15th July, 1957. Candidates should be in sympathy with the evangelical Christian aims of the Hospital.

Applications and references to be addressed to the Medical Superintendent as soon as possible.

MILDMAY MISSION HOSPITAL, Austin-street, London, E.2. Applications are invited for the pre-registration post of RESIDENT HOUSE SURGEON (post recognised for F.R.C.S.), vacant on 15th July, 1957. Candidates should be in sympathy with the evangelical Christian aims of the Hospital.

Applications and references to be addressed to the Medical Superintendent as soon as possible.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. RESIDENT HOUSE SURGEON (general surgery), pre- or post-registration, required for 6 months. Post recognised for F.R.C.S. Vacant 1st August.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 3rd July.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD AND THE BOARD OF GOVERNORS OF LONDON HOSPITAL. SENIOR REGISTRAR in Psychiatry under Joint Training Scheme. Appointment at Claybury Hospital, Woodford Bridge, Essex (resident or non-resident), for 2 years and subsequently 1 year at St. Clement's Hospital, Psychiatric Unit, and 1 year at the London Hospital. Appointment subject to annual review.

Application forms from Secretary, North East Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, to be returned by 6th July.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD AND BOARD OF GOVERNORS OF LONDON HOSPITAL. SENIOR REGISTRAR in Obstetrics and Gynæcology under Joint Training Scheme. Appointment initially at Rochford General Hospital, Rochford, Essex (resident or furnished or unfurnished accommodation available), and after 18 months to 2 years at the London Hospital. Appointment subject to annual review.

Application forms from Secretary, North East Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, to be returned by 6th July.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

SURGICAL REGISTRAR (resident or non-resident, sleeping in on duty nights), Mile End Hospital, Bancroft-road, E.1. Recognised for F.R.C.S.

SURGICAL REGISTRAR (resident, or non-resident near Hospital), St. Andrew's Hospital, Billericay, Essex. Recognised for F.R.C.S.

ANÆSTHETIC REGISTRAR (resident), Oldchurch Hospital, Romford, Essex. Recognised for D.A. Some duties in the Neurosurgical Theatre.

ANÆSTHETIC REGISTRAR (resident), Poplar Hospital, East India Dock-road, E.14. Recognised for D.A. and F.F.A.R.C.S.

MEDICAL REGISTRAR (resident or non-resident), Hackney Hospital, Homerton High-street, London, E.9.

MEDICAL REGISTRAR (non-resident), Chase Farm Hospital, Enfield, Middlesex. Clinical research is encouraged.

Appointments subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 6th July.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of ANÆSTHETIC REGISTRAR (resident). This post carries the grade of Registrar.

Applications, giving the names of 3 referees, to be sent to the undersigned not later than 3rd July, 1957.

H. EWART MITCHELL,
Secretary to the Board of Governors.
The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W.1. (General Hospital of 158 Beds.) Applications are invited to fill the undermentioned posts :—

RESIDENT MEDICAL OFFICER (Senior House Officer), vacant 18th August.

1 HOUSE PHYSICIAN (general), pre-registration post, vacant 30th July.

2 HOUSE SURGEONS (general), pre-registration posts: 1 vacant 14th August ; 1 vacant 21st September.

Applications by post-registration candidates will also be considered.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to Hospital Secretary by 2nd July.

PLAISTOW HOSPITAL, Samson-street, London, E.13. Applications are invited for appointment of SENIOR HOUSE OFFICER (resident) to the Chest Unit and Infectious Diseases Unit at the above Hospital for 12 months commencing early July, 1957. Previous experience in diseases of the chest is desirable ; excellent experience is afforded in the investigation of chest and infectious diseases cases and there are good facilities for postgraduate study for the M.R.C.P. examination.

Applications, with copies of recent testimonials, to M. J. HUNTLEY, Group Secretary, West Ham Group Hospital Management Committee, Stratford, London, E.15, by 26th June, 1957.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER (Male or Female) graded Senior House Officer, at Shadwell, E.1, to become vacant 1st September, 1957. Candidates must have had experience in the treatment of sick children. The appointment will be for 1 year.

Application forms may be obtained from the Secretary at Hackney-road, and should be returned, with copies of not more than 3 testimonials, not later than 1st July, 1957.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN, Hackney-road, E.2. OPHTHALMIC ASSISTANT required. Attendance required on Thursday mornings. Salary £175 p.a.

Applications, with copies of available testimonials, to Group Secretary.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. QUEEN CHARLOTTE'S MATERNITY HOSPITAL. JUNIOR OBSTETRIC OFFICER (Senior House Officer), resident posts tenable for 6 months from 1st October, 1957.

Applications to the House Governor by 6th July, 1957, on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. ANÆSTHETIST (Senior House Officer), resident post tenable for 6 months from 1st October, 1957, in the first instance, for duties at both hospitals. Post recognised for the purpose of the F.F.A.R.C.S.

Applications to the House Governor by 6th July, 1957, on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. QUEEN CHARLOTTE'S MATERNITY HOSPITAL, Goldhawk-road, London, W.6. Applications are invited from candidates holding the M.R.C.O.G. for the whole-time post of RESIDENT OBSTETRICIAN (Senior Registrar grade) at Queen Charlotte's Maternity Hospital, tenable from 1st September, 1957. The successful applicant will be Tutor in Obstetrics in the Institute of Obstetrics and Gynæcology of the University of London and may be afforded an opportunity to undertake some work at Chelsea Hospital for Women.

Applications, stating age, qualifications with dates and previous appointments, together with the names of 3 referees, should be sent to the House Governor, 339, Goldhawk-road, London, W.6, not later than 6th July, 1957.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE PHYSICIAN (pre-registration) required for 6 months commencing 2nd July, 1957.

Applications, with copies of recent testimonials, to Hospital Secretary by 26th June, 1957.

ROYAL FREE HOSPITAL GROUP. Applications are invited from suitably qualified medical practitioners for the post of Part-time SENIOR REGISTRAR (6 sessions per week) in the Ophthalmic Departments of the Royal Free Hospital. The appointment is for 1 year in the first instance.

Formal application should be made, giving the names of 3 referees, to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 8th July, 1957.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the appointment of SENIOR ORTHOPÆDIC REGISTRAR (full-time), non-resident. Applicants must be Fellows of 1 of the Royal Colleges of Surgeons. During the tenure of office 1 year may be spent at the Luton and Dunstable Hospital and 6 months at The Hospital for Sick Children, Great Ormond-street.

Applications to be received not later than 6th July. Forms of application from the House Governor, 234, Great Portland-street, London, W.1.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General Medicine to fill a vacancy in the approved trainee establishment at the Bermondsey and Southwark Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1. not later than 6th July, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for 2 appointments as Whole-time REGISTRARS in Anæsthetics to fill vacancies in the approved trainee establishment at the following Groups of hospitals respectively :—

(1) Bermondsey and Southwark.
(2) Greenwich and Deptford.

The appointments will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 6th July, 1957.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, London, S.W.4. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered Women medical practitioners for the post of Full-time SURGICAL REGISTRAR (recognised for the F.R.C.S.). Resident or non-resident (if living near the Hospital). Vacant shortly. The appointment is normally for 2 years but subject to review at the end of first year. Canvassing will disqualify, but candidates are not precluded from visiting the Hospital if they so desire.

Forms of application from the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed applications should be returned not later than 13th July, 1957.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Women medical practitioners for the post of HOUSE PHYSICIAN, vacant 13th September, 1957, for a period of 6 months.

Forms of application from the Secretary.

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. LAMBETH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from Women candidates for the post of HOUSE SURGEON (pre-registration) at the above Hospital. Duties include general surgery and the successful applicant will also be required to provide relief for leave of the House Surgeon at the Annie McCall Maternity Hospital.

Application forms from the Hospital Secretary to be returned not later than 13th July, 1957.

ST. ANN'S GENERAL HOSPITAL, N.15. Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN (Senior House Officer) to above Hospital for duty in the Chest Department with other general duties for a period of 6 months from 25th August, 1957.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 13th July, 1957.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer) for 1 year.

Applications, with 2 recent testimonials, to the Hospital Secretary by 29th June, 1957.

ST. MARY'S HOSPITAL, W.2. Ophthalmic Department. WESTERN OPHTHALMIC HOSPITAL, Marylebone-road, N.W.1. Applications are invited for the post of Whole-time SENIOR REGISTRAR (non-resident). Candidates must have post-graduate experience and should hold, or be studying for, the F.R.C.S. The successful candidate will be expected to take up his duties as soon as possible.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, should reach ALAN POWDITCH, House Governor, St. Mary's Hospital, not later than 12th July, 1957.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior REGISTRAR to the Department of Anæsthetics, whole-time, for a period of 1 year in the first instance from 1st September, 1957.

Applications, naming 2 referees, to the Clerk of the Governor by 28th June, 1957.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of REGISTRAR in the E.N.T. Department for 1 year from 1st September, 1957. The post will be graded Registrar or Senior House Officer according to experience.

Applications, with names of 2 referees, to Administrator and Secretary by 5th July, 1957.

WEST HAM GROUP HOSPITAL MANAGEMENT COMMITTEE, Stratford, E.15. ANÆSTHETIST (Resident Senior House Officer grade) for 12 months commencing 11th August, 1957. 6 months at Queen Mary's Hospital for the East End and 6 months at East Ham Memorial Hospital. Combined post recognised for D.A. and F.F.A.R.C.S.

Applications, with names of 3 referees, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 5th July, 1957.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of REGISTRAR to Chemical Pathology Department for 1 year in first instance from 1st October, 1957.

Applications (5 copies), with names of 2 referees, to House Governor by 6th July.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for SENIOR RESIDENT AND CASUALTY OFFICER (Registrar grade) for 1 year in first instance from 1st October, 1957. Board-residence £150 p.a.

Applications (9 copies), with names of 2 referees, to House Governor by 6th July.

WHIPPS CROSS HOSPITAL, London, E.11. Applications are invited for the post of Pre-registration HOUSE PHYSICIAN (general medicine) which becomes vacant 17th July, 1957.

Application forms from the Hospital Secretary, to be returned by 1st July, 1957.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON for Traumatic and Orthopædic Unit. 6 months appointment, suitable for pre-registration candidate.

Applications, stating age, qualifications and experience with copies of up to 3 recent testimonials, to Medical Director of Hospital immediately.

ASHFORD HOSPITAL, Ashford, Middlesex. North West METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR required at above Hospital (560 Beds with all the usual special departments) for general anæsthetic duties at Ashford and such other hospitals within the Group as may be necessary. Post recognised for D.A. and F.F.A.R.C.S., vacant 8th August, 1957. The Hospital may be visited by direct appointment with the Medical Director.

Application forms obtainable from, and returnable to, the Secretary, Staines Group Hospital Management Committee, Ashford Hospital, Ashford, Middlesex.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDEVILLE HOSPITAL. PLASTIC SURGERY AND JAW INJURIES UNIT. (NUFFIELD BURNS UNIT.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER in the above department of the Hospital. Duties will include care of patients in the Burns Unit (under supervision), and also work in general plastic wards and the theatre.

Applications, with the names of 2 referees, to the Administrative Officer.

BANGOR. CAERNARVON AND ANGLESEY GENERAL HOSPITAL. Applications are invited for the post of HOUSE SURGEON at the above Hospital (recognised for F.R.C.S.). The appointment is for a period of 6 months. Salary and conditions of service in accordance with those approved by the Ministry of Health.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Group Secretary, Caernarvon and Anglesey Hospital Management Committee, Plas Gwyn, Ffriddoedd-road, Bangor, within 10 days of the appearance of this advertisement.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE PHYSICIAN (pre-registration) required. Post vacant mid-July.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. Locum REGISTRAR (anæsthetics), resident, required immediately. Appointment for 3 months in first instance, and thereafter on week-to-week basis.

Applications to Hospital Secretary (Tel. : Bishop's Stortford 963).

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) HOUSE PHYSICIAN (House Officer or Senior House Officer grading according to experience). Pre-registration post, but fully qualified practitioners may apply.

Apply Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) Locum ORTHOPÆDIC HOUSE SURGEON (Senior House Officer or House Officer grading according to experience).

Applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) ORTHOPÆDIC HOUSE SURGEON (first, second or third post), vacant now. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) HOUSE OFFICER in Obstetrics and Gynæcology. Pre-registration post, House Officer or Senior House Officer grading according to experience. Vacant shortly. Hospital has Maternity Unit of 22 Beds and Gynæcological Annexe of 18 Beds. Married quarters may be available.

Detailed applications to Group Secretary.

BEDFORD GENERAL HOSPITAL. (436 Beds.) House SURGEON required. Pre- or post-registration. Recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute Surgical Units.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (436 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Locum GENERAL SURGICAL REGISTRAR required from 2nd to 23rd July.

Applications, giving full details of experience and names of 2 referees, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEONS (resident), vacant June. Hospital largest Traumatic Unit in country and treats over 50,000 new patients each year. Recognised for purpose of casualty by R.C.S. (Eng.). Teaching programme by Consultant staff. 6-month appointment, some of which may be spent in 42-bedded Medical Research Council's Burns Unit.

Apply, naming 2 referees, to Administrator by 29th June, 1957.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. HOUSE PHYSICIAN (Male/Female), vacant 12th July, 1957. Recognised as pre-registration appointment.

Apply Physician-Superintendent, with copies of 2 testimonials or names of referees.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. HOUSE SURGEON (Male or Female). Recognised as pre-registration appointment. Post vacant July.

Apply Physician-Superintendent with copies of 2 testimonials or names of referees.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. 3 HOUSE SURGEONS required. Vacant 1st and 4th July and 1st August, 1957. Recognised for pre-registration and F.R.C.S. Each appointment in a unit of approximately 85 adult and children's general surgical beds under control of 2 Consultant Surgeons.

Detailed applications, with copies of 2 recent testimonials, to Group Secretary.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Stoke-on-Trent Group, Princes-road, Stoke-on-Trent**

(*a*) REGISTRAR (obstetrics and gynæcology). Duties at City General and Limes Maternity Hospital (Obstetrics 100 Beds, Gynæcology 40 Beds). Experience specialty essential. Resident/non-resident. Recognised for M.R.C.O.G./D.Obst.R.C.O.G. Vacant 8th August.

(*b*) REGISTRAR (E.N.T. surgery) for North Staffordshire Royal Infirmary (455 Beds). Experience specialty essential. Resident or non-resident.

(*c*) MEDICAL REGISTRAR (chest diseases). Duties mainly at Cheshire Joint Sanatorium (305 Beds) with periods of transfer to Tuberculosis Unit (Pregnancy and Diabetic) at City General Hospital and Stoke-on-Trent Chest Clinic. The post offers wide experience in the investigation and medical and surgical treatment of tuberculosis and other chest diseases. Possible married accommodation available later.

(2) **Birmingham (Selly Oak Group), Oak Tree-lane, Birmingham, 29**

(*a*) SURGICAL REGISTRARS. For Birmingham Accident Hospital, Bath-row, Birmingham, 15 (215 Beds). 1 vacant July, 1957. Duties as surgical Assistant to Clinical Director. 1 vacant August, 1957. Duties with accident surgery team and possibility of transfer to Burns Unit. General surgical experience essential. Higher qualification an advantage.

(*b*) REGISTRAR (obstetrics and gynæcology), resident. Duties at Selly Oak Hospital (1055 Beds—34 gynæcological, 33 obstetric). Post recognised for the purpose of the M.R.C.O.G.

(3) **Stafford Group, 13, Foregate-street, Stafford**

REGISTRAR (medicine), resident. Duties mainly at Staffordshire General Infirmary, Stafford (175 Beds). Experience specialty and higher qualification desirable.

(4) **Wolverhampton Group, The Royal Hospital, Wolverhampton**

REGISTRAR (pathology), resident or partly resident. Experience in specialty an advantage. Duties in all branches of clinical pathology centred on the Royal Hospital.

Application forms from Group Secretaries to be returned by 1st July, 1957.

BIRMINGHAM. ST. CHAD'S HOSPITAL, Hagley-road, BIRMINGHAM, 16. SENIOR HOUSE OFFICER in the Obstetric and Gynæcological Unit, vacant 14th July, 1957. Tenable for 12 months. Recognised for M.R.C.O.G. Unit affiliated to University of Birmingham for undergraduate clinical tuition.

Detailed applications, with copies of 2 recent testimonials, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. ST. CHAD'S HOSPITAL, Hagley-road, BIRMINGHAM, 16. HOUSE SURGEON, vacant 7th July, 1957, for duties in general surgery. Recognised for pre-registration.

Detailed applications, with recent testimonials, to the Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. RUBERY HILL HOSPITAL. (980 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required, resident or non-resident, Male or Female. Valuable experience provided in the investigation, diagnosis and treatment of all forms of psychiatric illness. D.P.M. course, Birmingham University. Previous postgraduate psychiatric experience not essential. Ministry of Health terms and conditions of service.

Applications, stating name, age, nationality, qualifications, experience, and providing the names of 3 referees, to be sent as soon as possible to the Group Secretary, Offices of the Hospital Management Committee, Rubery Hill Hospital, Birmingham.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM MATERNITY HOSPITAL. Applications are invited from registered medical practitioners for the post of RESIDENT OBSTETRIC HOUSE SURGEON vacant 1st September, 1957. The appointment is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G.

Application forms obtainable from the House Governor, the Birmingham and Midland Hospitals for Women, Showell Green-lane, Sparkhill, Birmingham, 11, to be returned not later than 6th July, 1957. G. A. PHALP, Secretary.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the appointment of SURGICAL REGISTRAR (Registrar grade) to the United Birmingham Hospitals. Candidates must have held a resident appointment and should hold at least a primary Fellowship qualification. Residency is desirable.

Forms of application from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, to be returned by 13th July, 1957.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

Royal Infirmary, Blackburn

HOUSE SURGEONS (2) required for 23rd July and 1st August. Posts recognised for F.R.C.S. and approved for pre-registration purposes.

HOUSE PHYSICIAN required for 23rd July. Post recognised for pre-registration purposes.

Queen's Park Hospital, Blackburn

HOUSE SURGEON required for 30th July. Post recognised for F.R.C.S. and approved for pre-registration purposes.

HOUSE PHYSICIANS (2) required for 1st and 3rd August. Post recognised for pre-registration purposes.

Victoria Hospital, Accrington

SENIOR HOUSE OFFICER (medicine) required for 22nd July.

Apply to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKPOOL VICTORIA HOSPITAL. Casualty Officer (Junior Hospital Medical Officer status). Salary £852 10s.–£55–£1182 10s. p.a. Recognised for F.R.C.S. A furnished flat is available in the married quarters situated in a detached property in a select residential area adjacent to the Hospital, but residence for single or married applicants is optional. Post available on short- or long-term basis from 1st July.

Applications, stating age, qualifications, experience and giving the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BLACKPOOL. VICTORIA HOSPITAL. Blackpool and FYLDE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for casualty and traumatic surgery. This is a new post introduced to augment the junior staff of the busy Casualty Department.

Applications, stating age, qualifications and experience and giving the names and addresses of 2 referees, should be sent to the Group Secretary.

BLACKPOOL. VICTORIA HOSPITAL. (353 Beds.) HOUSE OFFICER (orthopædic surgery). Resident pre-registration post recognised for F.R.C.S. available from 22nd July, 1957, in the main acute general hospital serving the Blackpool and Fylde area.

Applications, stating age, experience (if any) and giving the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOSCOMBE. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of NON-RESIDENT SENIOR HOUSE OFFICER (orthopædics and casualty combined). The post, which is recognised for the F.R.C.S. examination, is now vacant. The Unit consists of Registrar and 2 Senior House Officers with an additional Senior House Officer during the summer months. Furnished flat available on sea front.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOSCOMBE. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of GENERAL HOUSE SURGEON. The appointment, which is recognised for the F.R.C.S. examination and pre-registration purposes, becomes vacant on 15th July, 1957.

Applications to the Hospital Secretary.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in Anæsthetics, to the above Group of hospitals. The post, which will become vacant on 1st October, 1957, is based at Bury General Hospital, and is recognised for the D.A. examination.

Apply, stating full details, and names of 2 referees, to—

H. WILKINSON, Esq., Group Secretary.

Bury General Hospital, Walmersley-road, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics to the above Group. The successful applicant will be based at Bury General Hospital. The post is recognised for the Diploma in Anæsthetics.

Apply, stating full details of age, experience, and names of 2 referees, to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Casualty and Orthopædics. This post is recognised for the F.R.C.S.

Full details, including nationality, age, qualifications, and experience, with the names of 2 referees, should be forwarded to—

H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

BURY ST. EDMUNDS. WEST SUFFOLK GENERAL HOSPITAL. (262 Beds.) Applications invited, with 3 references, for a HOUSE OFFICER or SENIOR HOUSE OFFICER for orthopædic and casualty duties. Recognised for F.R.C.S. (Surgical). Vacant late June. A Junior Hospital Medical Officer Casualty Officer is also employed.

Inquiries to Hospital Secretary.

BOLTON. THE ROYAL INFIRMARY. (237 Beds.) RESIDENT SENIOR HOUSE OFFICER in Surgery (Assistant Resident Surgical Officer). Tenable for 12 months and recognised for F.R.C.S.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, should be sent immediately to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

The Royal Infirmary, Bolton (237 Beds)

RESIDENT HOUSE SURGEONS (3) for general surgical duties. Vacant 3rd July, 16th July and 8th August. Recognised for F.R.C.S.

Bolton District General Hospital (607 Beds)

RESIDENT HOUSE PHYSICIANS (2), vacant 24th July and 14th August.

RESIDENT HOUSE SURGEON, vacant 22nd August. Recognised for F.R.C.S.

All posts tenable for 6 months and recognised under Pre-registration Service Scheme.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, should be sent immediately to Group Secretary, The Royal Infirmary, Bolton.

BRECHIN, ANGUS. STRACATHRO HOSPITAL. (676 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Orthopædic Unit (178 Beds). Salary £819 10s. p.a.

Applications for this appointment, which is now vacant, should be addressed to the Group Medical Superintendent, at the above Hospital.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON to the Orthopædic Unit. Salary in accordance with national scale. This post is recognised as a pre-registration appointment.

Applications, stating age, qualifications, and experience, together with copies of recent testimonials, should be sent to the Physician-Superintendent, Brighton General Hospital, Elmgrove, Brighton.

BRIGHTON. NEW SUSSEX HOSPITAL FOR WOMEN, Windlesham-road, BRIGHTON, 1. Locum HOUSE SURGEON (Female), Senior House Officer grading, required for the period 15th July–1st August, inclusive. Salary at the rate of £15 19s. per week, less residential emoluments.

Applications, with full particulars, to be sent to the Administrative Officer as soon as possible.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.)

HOUSE SURGEON required mid-July.

2 CASUALTY HOUSE SURGEONS (duties include work in Orthopædic and Traumatic Unit), vacant beginning and end July.

All posts recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN, Dyke-road. (130 Beds.) Vacancy for HOUSE SURGEON for 6 months from 1st August, 1957. The post offers wide experience in pædiatrics and is recognised for D.C.H. The post is open to pre-registration candidates.

Applications, stating age, nationality, qualifications, and experience, together with copies of recent testimonials, to the Administrative Officer as soon as possible.

BUSHEY MATERNITY HOSPITAL, Bushey Heath, HERTFORDSHIRE. (50 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time RESIDENT OBSTETRIC REGISTRAR required at above Hospital. Duties include antenatal clinics at the Edgware General Hospital, Edgware, Middlesex, and the Boreham Wood Health Centre, Boreham Wood, Herts. Possession of M.R.C.O.G. desirable, but not essential. Post vacant 29th July, 1957. Married quarters available if required. Hospital may be visited by direct appointment with Medical Director, Edgware General Hospital.

Application forms obtainable from, and returnable to, Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 2nd July, 1957.

BURTON-ON-TRENT. GENERAL HOSPITAL. Non-RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER ANÆSTHETIST required at the above Hospital.

Applications to Group Secretary, General Hospital, Burton-on-Trent, as soon as possible.

BROMSGROVE, WORCESTERSHIRE. HILL TOP HOSPITAL. (76 Beds.) REGIONAL THORACIC SURGICAL CENTRE. Applications are invited for the pre-registration post of HOUSE PHYSICIAN at the above Hospital. Post vacant early July.

Applications, with the names of 3 referees, to the Hospital Secretary, Bromsgrove General Hospital, Worcestershire.

BROMSGROVE, WORCESTERSHIRE. HILL TOP HOSPITAL. (76 Beds.) REGIONAL THORACIC SURGICAL CENTRE. Applications are invited for the pre-registration post of HOUSE SURGEON at the above Hospital. Post vacant early July.

Applications, with the names of 3 referees, to the Hospital Secretary, Bromsgrove General Hospital, Worcestershire.

CAMBRIDGE (near). FULBOURN HOSPITAL. Senior HOUSE OFFICER (resident or non-resident). Previous psychiatric experience not required. This Hospital of 974 Beds is linked with the Cambridge University Department of Psychology and Addenbrooke's Hospital, and provides a basic psychiatric training leading to the D.P.M.

Applications, stating age, qualifications and experience with names of 2 referees, should be sent to—

Dr. D. H. CLARK, Medical Superintendent.

Fulbourn Hospital, near Cambridge.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. House SURGEON for 6 months from 14th August. Recognised Pre-registration Service.

Apply, stating age, nationality, qualifications, and experience with dates, and copies of 3 testimonials, to Secretary by 6th July. Interviews 22nd July.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) GYNÆCOLOGICAL HOUSE SURGEON required at Highland Court Annexe, a unit of 25 gynæcological beds situated 3 miles from the above Hospital, with all ancillary services available. Recognised for M.R.C.O.G. 6 months appointment. Post now vacant. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF. ST. DAVID'S HOSPITAL. Senior House OFFICER (may be Locum) required for Accident Unit at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARLISLE. CUMBERLAND INFIRMARY. (331 Beds.) SENIOR HOUSE OFFICER (general surgery) required. Recognised for F.R.C.S. examination.

Forms of application may be obtained from the Group Secretary, Cumberland Infirmary, Carlisle.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (188 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of RESIDENT HOUSE OFFICER (surgical) which will become vacant on 1st August, next. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (A General Children's Hospital of 700 Beds.) RESIDENT MEDICAL REGISTRAR required to a firm comprising 200 Beds, including acute medical (60 Beds), poliomyelitis, rheumatism, and long-stay wards, and with certain medical administrative duties.

Applications on form obtainable from the Group Secretary, should be returned by 6th July, 1957.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON (post approved for Pre-registration Service). General surgery with duties in genito-urinary. Vacant now.

Applications, giving age, qualifications, &c., with copies of recent testimonials and the names of referees, should be sent to Secretary, at above address.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON required on Surgical Unit of 78 Beds. Post recognised for F.R.C.S. examination and approved for pre-registration experience.

Applications, stating age, qualifications, and experience, with copies of recent testimonials and the names of 2 referees, should be sent to the Secretary at above address.

CHEPSTOW, MONMOUTHSHIRE. ST. LAWRENCE HOSPITAL. (127 plastic surgery, 50 orthopædic beds.) PLASTIC SURGERY, JAW INJURIES AND BURNS CENTRE. SENIOR HOUSE OFFICER in Plastic Surgery required. There are 2 residents in plastic surgery and 1 in orthopædics. Post tenable 6 or 12 months as desired, and candidates experienced in another specialty wishing to gain plastic surgery experience will be considered. Salary £819 10s., less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) SENIOR HOUSE SURGEON (Deputy Resident Surgical Officer) required at above Hospital. Post recognised for F.R.C.S. Resident staff of 6—Resident Surgical Officer, 3 House Surgeons, Resident Medical Officer, and House Physician. Salary £819 10s. p.a., less residential charge. Vacant 4th August, 1957.

Applications, stating age, experience, qualifications with references, or names of referees, to Senior Administrative Officer.

CROYDON. GENERAL HOSPITAL. (200 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer) resident. Post vacant now. Recognised for Final F.R.C.S. examination. There is a Registrar in charge of Department.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon.

CROYDON. QUEEN'S HOSPITAL. (450 Beds.) Geriatric UNIT. CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident). Suitable for candidate reading for higher qualification. Post vacant now.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, to be returned within 14 days.

CHELMSFORD HOSPITALS. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer) to large surgical units.

Applications, stating age, qualifications, and experience, with recent testimonials, should be sent to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Essex County Hospital, Colchester, Essex (185 Beds)

Post of HOUSE OFFICER (surgical). First, second, third or pre-registration post, tenable for 6 months. Recognised for F.R.C.S.

Post of HOUSE PHYSICIAN (first, second, third or pre-registration post), tenable for 6 months.

Post of SENIOR HOUSE OFFICER (casualty and radiotherapy). Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Post of Locum Tenens ANÆSTHETIC REGISTRAR. For 2 weeks commencing 8th July, 1957, for duties at Essex County Hospital and other hospitals in Group.

Essex County Hospital (19 gynæcological beds)
Colchester Maternity Hospital (22 obstetric beds)

Post of HOUSE OFFICER (Male or Female), obstetric and gynæcological. First, second, third or pre-registration post ; tenable for 6 months.

Black Notley Hospital, Braintree, Essex (516 Beds)

Post of HOUSE SURGEON (first, second, third or pre-registration post). Includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COULSDON, SURREY. NETHERNE HOSPITAL. SOUTH WEST METROPOLITAN REGION. Applications are invited for the appointment of SENIOR REGISTRAR (whole-time) at the above Hospital. Applicants should possess the D.P.M. and a higher medical qualification. The Hospital has an admission-rate of 1600 a year, and all modern forms of treatment are carried out. There are 4 active Outpatients Departments in General Hospitals and Departments of Clinical Research, Neurosurgery, Psychology and Social Service and a modern Electroencephalographic Unit. There are 2026 Beds including 168 for informal admissions.

Application forms may be obtained from the Secretary, Netherne Hospital.

DERBY. DERBYSHIRE CHILDREN'S HOSPITAL. (86 Beds.) SENIOR HOUSE OFFICER (pædiatrics) required, vacant 15th August, 1957. Recognised for D.C.H.

Applications, with 2 names for reference, should be sent as soon as possible to Hospital Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade), vacant August, 1957. Preference will be given to an applicant who is studying for a higher qualification in any branch of medicine, not necessarily pathology. The holder is expected to attend clinical work in the Royal Infirmary and sometimes in associated hospitals.

Apply, stating full details and 2 names for reference, to Secretary.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications invited for pre-registration post of HOUSE SURGEON. Salary in accordance with Whitley scale. 4 residents on staff. Post now vacant.

Apply to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DURHAM HOSPITAL MANAGEMENT COMMITTEE.

Dryburn Hospital, Durham (303 Beds)

HOUSE PHYSICIAN for Pædiatric Unit of 42 Beds. Approved pre-registration post and recognised for the D.C.H.

SENIOR HOUSE PHYSICIAN for Pædiatric Unit of 42 Beds. The appointment is suitable for fully registered practitioners and is of 1 years duration from 1st August, 1957.

SENIOR HOUSE OFFICER in Surgery. This is a post with shared duties between the Departments of General Surgery, E.N.T., and Eyes.

HOUSE SURGEON (general surgery). Approved pre-registration appointment and recognised under the F.R.C.S. regulations.

HOUSE PHYSICIAN (general medicine). Approved pre-registration post.

SENIOR HOUSE OFFICER in Anæsthetics. Post recognised for D.A. and F.F.A.R.C.S. Previous experience in anæsthetics is not essential.

General Hospital, Chester-le-Street (204 Beds)

HOUSE PHYSICIAN (general medicine). Approved pre-registration post.

All the above posts are vacant on 1st August, 1957.

Apply, with particulars of previous experience and names of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR, Peterborough Memorial Hospital and Annexes. Post recognised for D.A. and F.F.A.R.C.S., and provides experience in all departments including a Thoracic Unit. Appointment for 1 year, renewable for second year.

Applications, stating age, experience, and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 1st July, 1957. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary, Memorial Hospital, Peterborough.

EDINBURGH CENTRAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited from registered medical practitioners and pre-registration graduates, for resident appointments for 6 months commencing 1st October, 1957. National Health Service scale.

Royal Hospital for Sick Children

2 HOUSE SURGEONS.
3 HOUSE PHYSICIANS.
1 HOUSE SURGEON (E.N.T.).

Chalmers Hospital

1 HOUSE SURGEON (gynæcological and Children's Surgical Annexe).

Applications, stating age, qualifications and experience and names of 2 referees, to be sent before 30th June to the Secretary, Edinburgh Central Hospitals Board, 1, Rillbank-terrace, Edinburgh, 9.

EDINBURGH. CHALMERS HOSPITAL. Applications are invited for the appointment of NON-RESIDENT SENIOR HOUSE OFFICER in General Surgery (with some E.N.T.) from medical practitioners qualified at least 1 year. Appointment is for 1 year commencing 1st October, 1957, at National Health Service scale of £819 10s. p.a.

Applications, with full particulars and names of 2 referees, should be sent before 30th June to the Secretary, Edinburgh Central Hospitals Board, 1, Rillbank-terrace, Edinburgh, 9.

EDINBURGH NORTHERN GROUP OF HOSPITALS. SENIOR HOUSE OFFICER (resident) required for Urological Unit, Western General Hospital.

Applications, with names of 2 referees, to the Medical Superintendent, Western General Hospital, Edinburgh, 4.

EDINBURGH. ROYAL HOSPITAL FOR SICK CHILDREN. Applications are invited from registered medical practitioners for 2 appointments of RESIDENT SENIOR HOUSE OFFICER (1 medical, 1 surgical) for 12 months commencing 1st October, 1957. National Health Service scale £819 10s. p.a.

Applications, stating age, qualifications and experience, and names of 2 referees, to be sent before 30th June to the Secretary, Edinburgh Central Hospitals Board, 1, Rillbank-terrace, Edinburgh, 9.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE SURGEON (approved pre-registration, first or second post), vacant 16th August, 1957. Duties with General Surgical Unit. Recognised by Royal College of Surgeons. 6 months appointment.

Applications, with the names and addresses of 2 referees, to Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital, by 29th June, 1957.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 5th August. Pre-registration post. Recognised for F.R.C.S.

Applications, stating age, qualifications and experience with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female), resident preferred, in the Psychiatric Unit which consists of 170 Beds with 1600 admissions yearly and deals with acute treatable cases ; it is recognised for the D.P.M. The appointment will be for 2 years in the first instance.

Applications, stating age, qualifications, and experience, and naming 2 referees, should be sent to the Medical Superintendent.

GLASGOW NORTHERN HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics at Stobhill General Hospital, Glasgow. The appointment will be for 1 year in the first instance.

Applications, stating age, qualifications, experience, and present appointment, and naming 2 referees, to be lodged with the Secretary, 13, Woodside-place, Glasgow, C.3, by 29th June, 1957.

GLASGOW. VICTORIA INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER in Orthopædics for duties at the Victoria Infirmary and a large unit at the Victoria Auxiliary Infirmary, Philipshill. The post, which is tenable for 1 year, is resident at Philipshill and is vacant as from 1st July, 1957.

Applications, with names of 2 referees, should be sent to the Secretary, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow, C.1.

GLASGOW. VICTORIA INFIRMARY. Senior House OFFICER (general medicine), 2 posts. Applications are invited from registered medical practitioners of not less than 2 years standing. The appointments are for 1 year from 1st September, 1957. Holders will be required to spend 6 months as Resident House Physician in the Cardiac and Metabolic Unit and 6 months, non-resident, with a General Medical Unit.

Applications, with names of 2 referees, to the Secretary, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow, C.1.

GRIMSBY GENERAL HOSPITAL. Grimsby Hospital MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædic). Orthopædic Unit of 71 Beds. Resident establishment—Registrar and 2 House Officers. Up-to-date Medical Library and reading facilities available.

Applications, with names of 2 referees, to Hospital Secretary.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) CASUALTY OFFICER required. Post recognised for F.R.C.S. examination. Grading Senior House Officer. 2 Casualty Officers employed who share the work of the department which is part of the Orthopædic and Traumatic Unit. Regular instruction given in traumatic surgery and Casualty Officers take part in the work of fracture clinics. Post vacant mid-July.

Applications, with copies of 2 testimonials, to Hospital Secretary as soon as possible.

GODALMING, SURREY. KING GEORGE V HOSPITAL FOR DISEASES OF THE CHEST. Whole-time RESIDENT THORACIC MEDICAL REGISTRAR required. All modern forms of treatment carried out, including major thoracic surgery, a proportion of the beds being set aside for non-tuberculous thoracic cases. The Hospital is associated with a chest clinic.

Application forms can be obtained from the Group Secretary, Milford Chest Hospital, Godalming, Surrey, to whom they should be returned by not later than 15th July, 1957.

GREENOCK. RAVENSCRAIG (MENTAL AND GENERAL) HOSPITAL. (472 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER. Resident post. Mental and general experience to be gained. Hospital is recognised as a training centre for the D.P.M. examination.

Applications, in writing, to the Physician-Superintendent as soon as possible.

HAROLD WOOD HOSPITAL, Harold Wood, Essex (near London). (415 Beds.) SENIOR HOUSE OFFICER (anæsthetics), resident. Main general and casualty hospital in Group. Recognised for D.A. and F.F.A.R.C.S.

Apply, giving full details, to the Hospital Secretary (Tel. : Ingrebourne 2851).

HASTINGS HOSPITAL MANAGEMENT COMMITTEE. Locum ORTHOPÆDIC REGISTRAR required for whole-time duties. 1st–14th July. Remuneration £19 5s. per week. Non-resident.

Apply, giving details of qualifications and experience, to Group Secretary, Hastings Hospital Management Committee, 11, Holmesdale-gardens, Hastings.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of RESIDENT HOUSE OFFICER (surgical) which will become vacant on 1st August, next. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of RESIDENT HOUSE OFFICER (medical) which will become vacant on 1st August, next. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. HOUSE SURGEON (pre-registration) required.

Applications, giving full details and copies of recent testimonials, should be sent to the Hospital Secretary at once.

HEMEL HEMPSTEAD, HERTFORDSHIRE. ST. PAUL'S AND WEST HERTS HOSPITALS. HOUSE PHYSICIAN (pre-registration) required to commence 5th July, 1957.

Applications, giving details and enclosing copies of 2 recent testimonials, should be sent to the Secretary, St. Paul's Hospital, Hemel Hempstead, Herts, at once.

HEREFORD. GENERAL HOSPITAL. (154 Beds.) HOUSE OFFICER (general surgery) required, pre-registration post. Hospital recognised by R.C.S. Duties include care of general surgical beds and in addition for 3 months of orthopædic beds and for 3 months of E.N.T. beds.

Applications, with copies of 2 testimonials, to be sent to the Group Secretary, Victoria House, Eign-street, Hereford.

HEXHAM GENERAL HOSPITAL, Northumberland. (304 Beds.) Applications are invited for the following posts, vacant in July next

HOUSE PHYSICIANS (2).

HOUSE SURGEONS (3), general surgery and orthopædics. Hospital recognised by the Royal College of Surgeons. There is a large orthopædic unit providing excellent experience in this branch of surgery. All are pre-registration posts but applications from registered practitioners will be considered and also from final year students in anticipation of graduation.

Applications, with the names of 2 referees, should be sent to the Group Secretary, General Hospital, Hexham, Northumberland.

HOVE. THE LADY CHICHESTER HOSPITAL, New Church-road, HOVE, SUSSEX. (70 Beds.) Applications invited for post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital, a Neurosis Centre for men, women, and children, with Outpatients Department. The post is resident and accommodation is only available for a single person. Salary £852 10s. p.a., rising by annual increments to £1182 10s. p.a., less a charge of £170 p.a. for board-residence. Conditions of service in accordance with national recommendations.

Applications, stating nationality, age, sex, qualifications, and experience, together with the names of 3 referees, to the Secretary, Hospital Management Committee, St. Francis Hospital, Haywards Heath, Sussex, as soon as possible.

HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T. Department of the Victoria Hospital for Sick Children and the Hull Royal Infirmary. The post, which is now vacant, is recognised for the F.R.C.S. and D.L.O.

Applications, with testimonials, should be sent to the Hospital Secretary, Victoria Hospital for Sick Children, Park-street, Hull.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgical), vacant mid-June. Post recognised for pre-registration purposes.

Apply, with full particulars and names of 2 referees, to Secretary, County Hospital, Huntingdon.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required, to commence duty immediately. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Resident ANÆSTHETIST (Senior House Officer) required 1st July, 1957. Recognised for D.A. and F.F.A.R.C.S. examinations.

Applications, stating age, nationality, qualifications, and experience, together with names of 2 referees, to the Medical Administrator, Lister Hospital, Hitchin, by 29th June, 1957.

ILFORD ISOLATION HOSPITAL, Grove-road, Chadwell HEATH (near London). There will be a vacancy for a SENIOR HOUSE OFFICER at the above Hospital. Salary will be at the rate of £819 10s. p.a., less emoluments. Small furnished bungalow available. This post will include some general medical duties and is suitable for persons studying for the M.R.C.P. and D.C.H.

Applications, giving particulars of experience and qualifications and accompanied by copies of testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary,

Ilford and Barking Group Hospital Management Committee.

King George Hospital, Ilford.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. House PHYSICIANS (2), pre-registration, required for General Medical Units.

Applications, stating age, nationality, qualifications with copies of up to 2 testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 1st July.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. House SURGEON (pre-registration), General Surgery Unit.

Applications, stating age, qualifications, and nationality, with copies of up to 2 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 1st July.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Resident Anæsthetist). The post, which becomes vacant on 1st July, 1957, and is normally of 1 years duration, is recognised for the D.A. and the F.F.A.R.C.S. examinations.

Applications, stating age and nationality, together with recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Senior Consultant General Surgeon. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Heath ROAD WING. (280 Beds.) Applications invited for the post of SENIOR HOUSE OFFICER to the Fracture and Orthopædic Department. Vacant early July, and recognised for R.C.S. examinations.

Applications, with full details, and copies of recent testimonials, to Hospital Secretary.

KETTERING. ST. MARY'S HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics and Gynæcology at above Hospital. Post vacant now. Previous experience is not necessary and the post would provide valuable experience in obstetrics and gynæcology for doctors intending to enter General Practice at some future date.

Applications, giving particulars of qualifications and enclosing copies of 3 recent testimonials, to be sent to the Group Secretary, Kettering and District Hospital Management Committee, General Hospital, Kettering, immediately.

KIRKCALDY. VICTORIA HOSPITAL. Registrar required to work under Consultant in charge of the Acute Medical Unit (65 Beds). Accommodation provided. Salary in accordance with national scale. Duties to commence on 1st September, 1957.

Apply, with copies of testimonials, to the Medical Superintendent, East Fife Hospitals Board of Management, 243A, High-street, Kirkcaldy.

LOUTH, LINCOLNSHIRE. COUNTY HOSPITAL. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (medical), vacant 1st August, 1957, at this busy General Hospital.

Applications, with full details, together with names of 2 referees, should be addressed to the Hospital Secretary.

LIVERPOOL, 15. SEFTON GENERAL HOSPITAL. (995 Beds.) Applications are invited from suitably qualified medical practitioners for the following appointments at the above Hospital which will become vacant on 1st September, 1957.

2 SENIOR HOUSE OFFICERS (medical).

2 SENIOR HOUSE OFFICERS (orthopædic).

The appointments will be for a period of 12 months. The salary will be at the rate of £819 10s. p.a. from which a deduction will be made at the rate of £150 p.a. for board, &c., if resident.

Application forms may be obtained from the undersigned to whom they should be returned not later than Tuesday, 2nd July, 1957. GARNET CHAPLIN, Secretary to the Committee.

LIVERPOOL, 15. SEFTON GENERAL HOSPITAL. (995 Beds, 116 Cots.) Applications are invited for the following resident appointments which will become vacant at the above-named Hospital on 1st September, 1957, and will be for a period of 6 months. These posts are approved as pre-registration posts.

6 HOUSE PHYSICIANS (general).
2 HOUSE PHYSICIANS (psychiatric).
3 HOUSE SURGEONS (general).
2 HOUSE SURGEONS (obstetric).
1 HOUSE PHYSICIAN (tropical).

The terms and conditions of service will be in accordance with the regulations of the Ministry of Health.

Application forms may be obtained from the undersigned to whom they should be returned not later than Tuesday, 2nd July, 1957.

GARNET CHAPLIN, Secretary to the
South Liverpool Hospital Management Committee.

LANCHESTER, co. DURHAM. MAIDEN LAW HOSPITAL. Applications are invited for the resident post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital. Appointment for limited tenure in the first instance with prospect of renewal. Married quarters are available at a charge to be determined in accordance with the services provided. The Hospital has 84 Beds for the treatment of pulmonary tuberculosis by all modern methods. Salary at the rate of £852 10s.–£55–£1182 10s. p.a., less a charge for board and lodgings or married accommodation.

Applications, stating age, qualifications, experience, with copies of recent testimonials, should be forwarded to the Group Secretary, North West Durham Hospital Management Committee, Shotley Bridge General Hospital, Consett, co. Durham.

LENNOXTOWN, STIRLINGSHIRE. LENNOX CASTLE MATERNITY HOSPITAL. Applications are invited from suitably qualified medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER in Obstetrics and Gynæcology at the above Hospital (170 Beds). The appointment will be for 6 months in the first instance and will be subject to the National Health Service (Scotland) superannuation regulations.

Applications (2 copies), stating age, qualifications and experience, present appointment and giving names of 3 referees, to be submitted to the Secretary, B.O.M. Lennox Castle, 113, Douglas-street, Glasgow, C.2.

LEICESTER ROYAL INFIRMARY. (492 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 1st July, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LUTON MATERNITY HOSPITAL, Luton, Bedfordshire. RESIDENT OBSTETRIC HOUSE SURGEON required 1st July, 1957. The post is tenable for 6 months in the first instance and is recognised for the D.Obst.R.C.O.G.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent by 25th June, 1957, to the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds.

MACCLESFIELD HOSPITAL. West Park Branch. Applications invited SENIOR HOUSE OFFICER (pædiatrics). Department is a busy one of 35 Beds and 30 neonatal cots and is recognised for purposes of Diploma in Child Health and provides valuable experience.

Apply immediately, quoting 2 referees, to Group Secretary, Macclesfield and District Hospital Management Committee, "Willerby House," Cumberland-street, Macclesfield.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the Ophthalmic Department of the above Hospital. Post vacant 17th August, 1957. The Hospital is recognised by the Examining Board for the F.R.C.S. and the D.O. Salary £819 10s. a year, less £150 a year for residential emoluments.

Applications should be forwarded, as soon as possible, to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Church-street, Maidstone.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the E.N.T. Department of the above Hospital. Post vacant 1st August, 1957. There are 55 E.N.T. beds and 6 specialist operating sessions each week. Valuable experience is available, and the post is recognised for the purpose of the F.R.C.S. and the D.L.O. Salary will be £819 10s. a year, less £150 a year for residential emoluments.

Applications to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone, Kent.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER. Recognised for F.R.C.S. Salary £819 10s. a year, less £150 a year for board and lodging. Post vacant August, 1957.

Applications to the Administrative Officer at the Hospital.

MARKET DRAYTON (near), SHROPSHIRE. CHESHIRE JOINT SANATORIUM. (305 Beds.) RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer or Senior House Officer according to experience). The post offers exceptional experience in the treatment of pulmonary tuberculosis.

Applications to the Medical Superintendent at the Sanatorium.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of Locum REGISTRAR in General Medicine to the West Manchester Hospital Management Committee. Primarily for duty at Park Hospital, Davyhulme, but with duties at other Group Hospitals.

Forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD invites applications for the post of REGISTRAR in Radiology (radiodiagnosis). The main duties will be with the Stockport and Buxton Hospital Management Committee, with some duties with the Macclesfield and District Hospital Management Committee, and the successful candidate will work under the direction of the Consultant Group Radiologist.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, by 30th June.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the resident post of REGISTRAR in Obstetrics and Gynæcology to the Wigan and Leigh Group of hospitals. Post recognised for M.R.C.O.G. Main duties at Billinge Hospital, Orrell, near Wigan.

Applications to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan.

MANCHESTER REGIONAL HOSPITAL BOARD AND THE BOARD OF GOVERNORS OF THE UNITED MANCHESTER HOSPITALS. NON-RESIDENT SENIOR REGISTRAR in Pathology. Facilities for training in all branches of pathology will be provided in both teaching and non-teaching hospitals in the Manchester area. Main duties initially at Manchester Royal Infirmary.

Application forms from the Senior Administrative Medical Officer, Manchester Regional Hospital Board, Cheetwood-road, Manchester, 8, to be returned by 10th July, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for 2 REGISTRAR posts in Radiotherapy at the Christie Hospital and Holt Radium Institute, Manchester, 20.

Applications, with full details, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The Board invite applications from registered practitioners for the post of RESIDENT SURGICAL OFFICER (Registrar grade) at Withington Hospital. The Resident Surgical Officer is appointed to 1 or more surgical firms and is responsible for surgical urgencies as part of his duties. Candidates must hold the F.R.C.S.

Applications, with full details, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The Board invite applications from registered practitioners for the post of REGISTRAR in Plastic Surgery at the Wythenshawe Hospital, which is a general hospital with 71 plastic surgery beds.

Applications, stating age, qualifications present post and names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER. ROYAL MANCHESTER CHILDREN'S HOSPITAL, PENDLEBURY, near MANCHESTER. SALFORD HOSPITAL MANAGEMENT COMMITTEE.

MEDICAL HOUSE OFFICERS (2).
SURGICAL HOUSE OFFICER.

Applications invited for above resident appointments, all vacant 1st August, 1957. Each appointment is for a period of 6 months and is open to pre-registration graduates.

Applications, with testimonials or names of referees, to the Hospital Secretary not later than 1st July, 1957.

MANCHESTER. ROYAL MANCHESTER CHILDREN'S HOSPITAL, PENDLEBURY, near MANCHESTER. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the resident post of SENIOR HOUSE OFFICER (surgical) vacant 1st August, 1957. Post is tenable for 6 months. Candidates should preferably have had previous pædiatric experience.

Applications, with testimonials or names of referees, to the Hospital Secretary not later than 1st July, 1957.

MANCHESTER. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) with duties in the South Manchester Group. This post is recognised by the Royal College of Surgeons for the F.F.A.R.C.S. and for the D.A.

Applications, stating age, present post, experience and the names of 2 referees, to be forwarded immediately to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. FIRST ASSISTANT (Registrar grade). There will very shortly be a vacancy in this grade and applications are invited from suitable candidates (salary at national scale). There is an establishment of 4 "First Assistants"—2 of Senior Registrar grade and 2 of Registrar grade. Initially the appointment will be for 1 year, renewable normally for a second year. The post is non-resident. The duties include very considerable clinical responsibility for obstetrical and gynæcological cases, including cases dealt with in the "Flying-squad" service. The supervision of House Officers and some teaching of undergraduate medical students are also involved. Candidates must therefore have had full previous experience in obstetrics and gynæcology. A higher qualification is desirable.

Forms of application may be obtained from the undersigned. The closing date is 30th June, 1957.

A. R. WISE, General Superintendent.
Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) including casualty duties, vacant immediately. The post is recognised for F.R.C.S. and possession of the primary F.R.C.S. will be an advantage. The Hospital is recognised by the Manchester University for the teaching of undergraduate students.

Applications, with full details, to the Group Secretary, Withington Hospital, immediately.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade), vacant on 2nd September, 1957. Previous experience in pathology not essential, the post affording opportunities for gaining experience in all branches of clinical pathology.

Applications, stating age, qualifications, present post, experience, and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER, 20. WITHINGTON HOSPITAL. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR HOUSE OFFICER (medical) required at the above Hospital for 2 months commencing approximately 22nd July.

Applications, with full details, to the Group Secretary at the Hospital immediately.

MANSFIELD. RANSOM HOSPITAL, Rainworth, near MANSFIELD. (205 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR or SENIOR HOUSE OFFICER (chest diseases) required for the Hospital. Thoracic surgery undertaken. Experience also available in chest clinic work and non-tuberculous chest diseases. Married quarters available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 1st July, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

MIDDLESBROUGH. NORTH RIDING INFIRMARY (Eye, Ear Nose and Throat Centre—114 Beds.) TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of Locum SENIOR HOUSE OFFICER (ophthalmology) at the above-named Hospital.

Applications, with full details, should be addressed, as soon as possible, to the Hospital Secretary.

MITCHAM JUNCTION, SURREY. WANDLE VALLEY HOSPITAL. RESIDENT MEDICAL OFFICER (Senior House Officer grade), vacant 9th August. The Hospital contains 152 Beds for infectious diseases and geriatric cases.

Applications, stating age, qualifications and experience, with the names of referees, should be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

MONTROSE, ANGUS, SCOTLAND. ROYAL MENTAL HOSPITAL. (944 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). An attractive, self-contained, unfurnished house is available for a married man. Single furnished quarters are also available. All subject to appropriate deductions. Previous experience in psychiatry is not essential. Salary and conditions of service in accordance with national scale.

Applications, stating age, qualifications, and experience, together with the names and addresses of 2 referees, should be forwarded immediately to the Physician-Superintendent.

NEWCASTLE REGIONAL HOSPITAL BOARD. Special AREA COMMITTEE FOR CUMBERLAND AND NORTH WESTMORLAND. ORTHOPÆDIC REGISTRAR required for Cumberland Infirmary, Carlisle (340 Beds). Appointment for 1 year, with likelihood of extension for second year. Residence provided for single doctor, if required.

Applications, with names of up to 3 referees, to Senior Administrative Medical Officer, 72, Warwick-road, Carlisle, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Senior REGISTRAR PHYSICIAN (whole-time), Durham Group of hospitals—main hospital Dryburn (303 Beds). Post available from 1st October, 1957. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE, 6. WALKER GATE HOSPITAL, Benfield-road. NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE PHYSICIAN in the Medical Unit of the above Hospital vacant as from 7th July, 1957. The work is mainly pædiatrics and acute infections, together with certain routine duties in the E.N.T. Unit.

Applications, together with the names of 2 referees, to be sent to the Hospital Secretary, Walker Gate Hospital, as soon as possible.

NEWMARKET GENERAL HOSPITAL. Applications are invited for the post of HOUSE SURGEON, vacant 27th July, 1957. Duties include surgical house charge of general surgical and some eye cases. Post resident and available for 6 months, recognised for pre-registration.

Applications, with copies of 3 testimonials, to the Medical Superintendent.

NORTHAMPTON GENERAL HOSPITAL. (482 Beds.) Immediate vacancy for SENIOR HOUSE OFFICER or for HOUSE OFFICER (Casualty Department), to work in conjunction with another Casualty Officer. Recognised for F.R.C.S. and (junior post) for medical pre-registration. Appointment to 30th September, 1957, or to 31st March, 1958, according to arrangement at interview.

Applications to S. C. HILL, Superintendent.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. Required, SENIOR HOUSE OFFICER, duties to commence on 1st July, 1957. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident pre-registration or registered HOUSE SURGEONS required immediately, 30th June and 31st July.

Applications, stating age, qualifications and nationality, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Resident Pre-registration HOUSE PHYSICIANS required 31st July.

Applications, stating age, qualifications and nationality, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Appli-cations are invited for the post of HOUSE PHYSICIAN, vacant 25th July, 1957. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. HEATHFIELD HOSPITAL, Hucknall-road, NOTTINGHAM. (Infectious Diseases.) Resident Locum MEDICAL OFFICER (Male or Female) required for holiday period of 8 weeks commencing 9th July, 1957. Junior Hospital Medical Officer rate of £19 5s. per week, less residential emoluments. Previous fever experience not essential.

Applications, with copies of 2 recent testimonials, as soon as possible to Physician-Superintendent.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. Applications are invited for SENIOR HOUSE OFFICER. Obstetrical and Gynæcological Department of 41 obstetric beds, 11 gynæcological beds and a small block for puerperal pyrexia. Duties to commence on 1st August, 1957. The Hospital is recognised for the M.R.C.O.G. (obstetrics only). Previous obstetrics experience required.

Applications, stating age, qualifications, experience and nationality, together with copies of recent testimonials, to be sent to the Secretary.

OXFORD REGIONAL HOSPITAL BOARD. Registrar (whole-time) in Anæsthetics to the Northampton Group of hospitals. Post provides good experience in all branches and is recognised for the F.F.A.R.C.S. Single accommodation available.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, to reach him by 29th June.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in General Surgery to the hospitals of the Reading Area. The appointment will be for 1 year and eligible for extension to 2 years. Single accommodation is available in the Hospital, but the successful candidate will be permitted to live out if he or she so desires.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 29th June.

OXFORD REGIONAL HOSPITAL BOARD. Registrar (whole-time, resident) in E.N.T. Surgery to the hospitals of the Northampton/Kettering area, mainly at Northampton General Hospital. Vacant 1st October for 1 year eligible for extension to 2 years. Recognised for the F.R.C.S.

Applications, on forms obtainable from Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 6th July.

OXFORD. UNITED OXFORD HOSPITALS. Applica-tions are invited for the post of a SENIOR HOUSE PHYSICIAN at the Churchill Hospital under the Regius Professor of Medicine and the General Physicians, to commence on 1st August for 6 months in the first instance, eligible for an extension of a further 6 months.

Applications, with names of 2 referees, to the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 29th June.

OXFORD. UNITED OXFORD HOSPITALS. Cowley ROAD HOSPITAL. REGISTRAR required in the above Hospital which is concerned with the treatment of acute and long-stay geriatric patients. Previous experience in this specialty desirable but not essential. Excellent training facilities for higher medical qualifications.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 30th June.

OXFORD. UNITED OXFORD HOSPITALS. Applica-tions are invited for a SENIOR HOUSE OFFICER at the Cowley Road Hospital which is concerned with the treatment of acute and long-stay geriatric patients. This post will be vacant with effect from 1st August, 1957, for 6 months in the first instance.

Applications, with names of 2 referees, to the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 30th June, 1957.

OXFORD. UNITED OXFORD HOSPITALS. Appli-cations are invited for post of NON-RESIDENT REGISTRAR to the Regius Professor of Medicine, Radcliffe Infirmary, commencing in August. This post will be for 1 year in the first instance, eligible for extension to a second year.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 30th June, 1957.

PAISLEY AND DISTRICT HOSPITALS BOARD OF MANAGEMENT. MATERNITY UNIT. HOUSE OFFICER required for term commencing 1st August, 1957. Applicants should preferably have held a previous hospital post.

Applications to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

PAISLEY AND DISTRICT HOSPITALS BOARD OF MANAGEMENT. PAISLEY I.D. HOSPITAL. HOUSE OFFICER required for Infectious Disease Unit. Post is recognised for pre-registration and becomes vacant on 1st August, 1957.

Applications to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

POOLE GENERAL HOSPITAL, Poole, Dorset. Bourne-MOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Locum REGISTRAR in Anæsthetics required for the period 8th–21st July.

Applications to the Hospital Secretary.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

HOUSE SURGEON (pre-registration post), vacant 23rd July, 1957. Recognised for the F.R.C.S. Freedom Fields Section.

HOUSE SURGEON (pre-registration post), vacant 1st July, 1957. Recognised for the F.R.C.S. Devonport Section.

Applications, stating age, nationality, and experience, with names of 3 referees, to be sent to the undersigned as soon as possible.

F. HALL, Deputy Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE.

East Glamorgan Hospital, Church Village, near Pontypridd (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 174,000. Recognised for D.Obst.R.C.O.G., F.R.C.S., D.C.H., F.F.A.R.C.S., D.A.)

SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant on 26th June, 1957.

SENIOR HOUSE OFFICER (anæsthetics), to commence 1st August, 1957.

SENIOR HOUSE OFFICERS (medicine), to commence 1st August, 1957.

SENIOR HOUSE OFFICER (pædiatrics), to commence 1st August, 1957.

2 HOUSE OFFICERS (medicine), to commence 1st August, 1957.

HOUSE OFFICER (pædiatrics), to commence 1st August, 1957.

4 HOUSE OFFICERS (surgery) (to include duties at Porth and District Hospital), to commence 1st August, 1957.

2 HOUSE OFFICERS (obstetrics), to commence 1st August, 1957.

Llwynypia Hospital, Llwynypia, Rhondda (50 acute medical beds : geriatric beds : serving area population of 112,000)

SENIOR HOUSE OFFICER (medicine), to commence 1st August, 1957. Person appointed will have part responsibility for the Group Infectious Diseases Hospital.

HOUSE OFFICER (medicine), to commence 11th August, 1957. To also undertake duties at the Group Infectious Diseases Hospital when required.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Courthouse-street, Pontypridd.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. PORTSMOUTH GROUP OF HOSPITALS. ANÆSTHETIST (Senior House Officer grade). Main duties at the Royal Portsmouth Hospital. Recognised for the F.F.A.R.C.S. Vacant 1st August, 1957.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

Saint Mary's Hospital, Milton-road, Portsmouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Queen Alexandra Hospital (87 surgical beds)

HOUSE SURGEON (pre-registration), vacant end of June.

Chest Services of the Portsmouth Group

SENIOR HOUSE OFFICER, vacant now.

Applications, stating age, experience, and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

Saint Mary's Hospital, Milton-road, Portsmouth.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER for E.N.T. Department, Royal Berkshire Hospital, Reading (40 Beds). Post recognised for D.L.O.

Applications, stating age, nationality, experience and qualifications, together with names of 2 referees, should be sent to Group Secretary, 3, Craven-road, Reading.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (area Accident and Orthopædic Department), vacant immediately. Recognised for F.R.C.S. Duties including work in area Casualty Department at Battle Hospital, Reading (300 Beds). Person appointed will work with Registrar and House Officers.

Apply, stating nationality, present post, and qualifications with dates, together with names of 2 referees, to Group Secretary, 3, Craven-road, Reading.

READING. BATTLE HOSPITAL. (391 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON in the Accident and Orthopædic Department. Post vacant 1st August. F.R.C.S. recognised. Also casualty duties.

Apply, stating age, qualifications with dates, nationality, present post, with 1 copy of recent testimonial, to Hospital Secretary.

READING COMBINED HOSPITALS. Area Department OF OBSTETRICS AND GYNÆCOLOGY. (100 Beds.) Applications are invited from registered medical practitioners for the resident post of HOUSE SURGEON to the above Department. The appointment, which is vacant on 1st July, 1957, is for 1 year, with 6 months gynæcology at the Royal Berkshire Hospital, and 6 months in the Maternity Unit at Battle Hospital. Both appointments are recognised for the Diplomas of the Royal College of Obstetricians and Gynæcologists.

Write, stating age and qualifications with dates, nationality, and present post, with copy of 1 recent testimonial, to Secretary, Royal Berkshire Hospital, Reading.

ROMFORD. OLDCHURCH HOSPITAL. Anæsthetic REGISTRAR required as holiday Locum immediately.

Apply for further particulars by letter or phone to Medical Superintendent.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (resident or non-resident) required for duties in the Casualty Department. Available for Male or Female applicants. This is a large General Hospital with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be forwarded immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required in the Orthopædic and Accident Unit from 17th June, 1957. The service consists of 100 beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital, as soon as possible.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) GYNÆCOLOGICAL HOUSE SURGEON (Male or Female), required. Unit comprises 35 gynæcological and 6 maternity beds. Resident post open to either pre-registration applicants or to fully qualified practitioners.

Applications to Medical Superintendent as soon as possible. Hospital may be seen by arrangement (Tel. Romford 7711).

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. (Not pre-registration appointment.)

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE.

St. James Hospital, Tredegar, Mon. (38 general medicine, 75 chronic sick, and 43 obstetric beds). Married quarters

HOUSE PHYSICIAN (from 5th August).

OBSTETRIC HOUSE OFFICER (30th July).

Tredegar General Hospital (20 miles from Newport, Mon., and 24 from City of Cardiff; 6 miles from the Vale of Usk). Surgical Unit of 50 Beds with also 6 orthopædic beds under daily supervision of Consultant Surgeon and visiting supervision of Orthopædic Surgeon. Busy Outpatient, Casualty, and Radiology Departments. Married quarters

HOUSE SURGEON (1st August).

Caerphilly District Hospital, Caerphilly, Glam. (Acute general hospital—228 Beds), 6 miles from City of Cardiff. Married quarters may be available

SENIOR HOUSE OFFICER (immediate) on general surgical wards.

HOUSE SURGEONS (1st August)—2 vacancies.

HOUSE PHYSICIAN (1st August).

HOUSE OFFICER (obstetrics and gynæcology) (1st August).

Applications to the Group Secretary, Central Offices, Caerphilly-road, Ystrad Mynach, Hengoed, Glam.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICERS (medicine), pre-registration, required at Birch Hill Hospital. 3 resident posts shortly available. Interviewing date 9th July, 1957.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Locum RESIDENT SURGICAL OFFICER (Registrar grade) required at Birch Hill Hospital for approximately 3 weeks in July.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROCHDALE GROUP OF HOSPITALS invites applications from newly qualified medical practitioners for 1 year rotating pre-registration posts. The first 6 months will be spent as HOUSE SURGEONS (2 months casualty, 4 months general surgery), and the second 6 months as HOUSE PHYSICIANS or OBSTETRICS AND GYNÆCOLOGICAL HOUSE SURGEONS. 3 posts vacant shortly. Interviewing date 9th July, 1957.

Immediate applications to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROCHFORD, ESSEX. GENERAL HOSPITAL. Locum MEDICAL REGISTRAR required at the above Hospital, from 6th to 20th July, 1957, inclusive.

Applications to the undersigned as soon as possible.

J. C. FIELD, Secretary.

ROCHFORD, ESSEX. GENERAL HOSPITAL. Locum HOUSE OFFICER required in the Obstetric Unit at the above Hospital, from 1st to 14th July, 1957.

Applications to the undersigned as soon as possible.

J. C. FIELD, Secretary.

SHEFFIELD. CITY GENERAL HOSPITAL. (652 Beds. Recognised for Final Fellowship examination.) **SHEFFIELD REGIONAL HOSPITAL BOARD.** Whole-time RESIDENT REGISTRAR (thoracic surgery) required. Appointment for 1 year in first instance. General Hospital with Regional Department of Cardiology. Thoracic Surgical Unit deals with tuberculous and non-tuberculous cases. Previous thoracic surgical experience desirable.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 1st July, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the post of SENIOR HOUSE OFFICER to the Medical Professorial Unit at the Royal Hospital. Post vacant 1st September, 1957.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 15th July, 1957, to the Superintendent, Royal Hospital, Sheffield, 1.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SENIOR REGISTRAR in Children's Psychiatry required. The post, intended to give experience with a view to specialising in children's psychiatry, is attached to the Mapperley Hospital, Nottingham, but is integrated with the child guidance clinics of the Nottingham City and County Councils. D.P.M. essential. A flat is available. Appointment for 1 year in first instance, reviewable annually.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 8th July, 1957.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR ANÆSTHETIST (resident or non-resident) at above Hospital, which is recognised for the F.F.A.R.C.S. Post vacant 5th October.

Further details and application forms obtainable from, and should be returned to, Group Secretary, Odstock Hospital, Salisbury, Wilts, within 10 days of the appearance of this advertisement.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order from 19th August, 1957, for a period of 6 months in each post. The post is open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALFORD. HOPE HOSPITAL. Salford Hospital Management COMMITTEE. Applications are invited for the post of PÆDIATRIC SENIOR HOUSE OFFICER which becomes vacant on 8th July, 1957, for a period of 12 months. Applicant holding the D.C.H. preferred. The department comprises 120 Beds, including medical, surgical, and infant wards, also an Outpatients Department. The pædiatric staff supervise the neonatal nurseries of the Obstetrical Department (approximately 70 lying-in beds).

Applications, stating details of experience and qualifications, together with the names and addresses of 3 referees, should be addressed to the Hospital Secretary as soon as possible.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in E.N.T. Surgery at the Royal Infirmary of Edinburgh, vacant on 25th August, 1957.

Apply, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 13th July.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Obstetrics and Gynæcology at the Elsie Inglis, Bruntsfield and Longmore Hospitals, Edinburgh, vacant on 18th September, 1957. The successful applicant may be required to reside in the Elsie Inglis Hospital.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 13th July, 1957.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

SENIOR REGISTRAR in Psychiatry for duties at the Glasgow Royal Mental Hospital and associated clinics.
REGISTRAR in Surgery based at Law Hospital, Carluke.
REGISTRAR in Surgery based at the Royal Alexandra Infirmary, Paisley.
REGISTRAR in Pathology based at the Dumfries and Galloway Royal Infirmary, Dumfries.
REGISTRAR in Pathology based at the Victoria Infirmary, Glasgow.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 6th July, 1957.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE PHYSICIAN (pre-registration or otherwise), vacant 1st August, 1957.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE SURGEON, vacant 1st August, 1957. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Locum PÆDIATRIC REGISTRAR required from 14th July to 3rd August, 1957, inclusive.

Applications, &c., to be sent to the undersigned as soon as possible. J. C. FIELD, Secretary.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Locum ORTHOPÆDIC REGISTRAR required from 13th July to 11th August, 1957, inclusive.

Applications, &c., to be sent to the undersigned as soon as possible. J. C. FIELD, Secretary.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Applications are invited for the post of DEPUTY CASUALTY OFFICER (Senior House Officer grade) with duties in the Fracture and Orthopædic Department for a period of approximately 5 months to end of October. Post resident.

Applications, stating age, qualifications and experience, with copies of recent testimonials, to reach the undersigned as soon as possible. J. C. FIELD, Secretary.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds.) RESIDENT HOUSE SURGEON required. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) for the Anæsthetic Department of the Southampton Group of hospitals. Special facilities for working for F.F.A.R.C.S. and D.A.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. The Hospital is the centre to which all trauma from a large industrial town and port is directed thus providing excellent experience in the treatment of traumatic conditions ; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General Surgery to fill a vacancy in the approved trainee establishment in the Medway and Gravesend Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 6th July, 1957.

SOUTHPORT GENERAL INFIRMARY. (189 Beds. Recognised for pre-registration and F.R.C.S.)

HOUSE SURGEON (general surgery and gynæcology).
HOUSE SURGEON (general surgery and ophthalmology).
HOUSE PHYSICIAN.

Appointments vacant first half of July.

Apply, stating age, qualifications, nationality, experience, and enclosing 2 recent copy testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum HOUSE SURGEON required 29th June–14th July. Pre-registration post—1 of 2.

Applications, with names of 2 referees, to Secretary.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds—Recovery Unit 32 Beds.) HOUSE SURGEON (pre-registration post), vacant 25th July. At end of service the successful applicant will be considered for appointment to a pre-registration post of House Physician if he or she has not held such an appointment.

Applications to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds—Recovery Unit 32 Beds.) HOUSE PHYSICIAN (pre-registration post), vacant 22nd July. At end of service the successful applicant will be considered for appointment to a pre-registration post of House Surgeon if he or she has not held such an appointment.

Applications to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts, which are approved for pre-registration purposes :—

Stockport Infirmary (163 Beds)

HOUSE OFFICER (general surgery and E.N.T.). Recognised for the F.R.C.S. and D.L.O. Vacant 31st July, 1957.
HOUSE OFFICER (general surgery and gynæcology). Recognised for the F.R.C.S. Vacant 21st August, 1957.
HOUSE OFFICER (general surgery and ophthalmology). Recognised for the F.R.C.S. and D.O.M.S. Vacant 11th September, 1957.

Stepping Hill Hospital (531 Beds)

HOUSE OFFICER (medicine), vacant 27th July, 1957.
HOUSE OFFICER (medicine), vacant 31st July, 1957.
HOUSE OFFICER (obstetrics). Recognised for the D.Obst. R.C.O.G. Vacant 3rd September, 1957.

Applications, with copies of 2 testimonials, to the Group Secretary, 59B, Shaw-heath, Stockport, to be received by 3rd July, 1957.

STOCKTON-ON-TEES. SEDGEFIELD GENERAL HOSPITAL. SEDGEFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (orthopædics). Full Consultant staff employed ; post recognised in connection with F.R.C.S. examinations ; modern self-contained furnished flat available at low rental.

Applications to the undersigned immediately.

L. WATSON, Group Secretary.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL Applications invited for HOUSE OFFICER (medical), vacant early July. Recognised pre-registration post.

Detailed applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE PHYSICIAN (general medicine) with dermatology. Vacant early July. Pre-registration post.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general medicine) with pædiatrics, vacant early July. Pre-registration post.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STORNOWAY. LEWIS HOSPITAL. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN at the above Hospital. The post, which becomes vacant on 1st August, 1957, is a pre-registration one and preference will be given to applicants with previous hospital experience.

Applications, together with copies of testimonials, should be sent immediately to—

Mr. IAN MACLEOD, Secretary and Finance Officer, Lews and Harris Hospitals Board of Management.

ST. ALBANS, HERTFORDSHIRE. HARPERBURY HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required at above Hospital. This is a modern hospital where 1729 mental defectives of all types and ages are under care. Approved for D.P.M. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Hospital Management Committee, Harperbury Hospital, St. Albans, Herts.

SWANSEA. MORRISTON HOSPITAL. (501 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the Casualty Department of the above Hospital.

Full particulars, stating age, qualifications, and experience, together with copies of 2 recent testimonials, should be sent to the Medical Superintendent of the Hospital.

T. E. JONES, Group Secretary.

SWANSEA. MOUNT PLEASANT HOSPITAL. (230 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in Obstetrics for the Maternity Unit of 40 Beds at the above Hospital. The post, which will become vacant on 11th August, 1957, is for a period of 12 months, and is recognised for the D.Obst.R.C.O.G. examination.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be sent to the Hospital Secretary not later than 28th June, 1957.

T. E. JONES, Group Secretary.

SWINDON AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. Applications invited for the appointment of SENIOR HOUSE OFFICER as Casualty Officer and Orthopædic House Surgeon at Great Western Hospital, Swindon, vacant 25th June. Post recognised by R.C.S. for 6 months of years training under Fellowship regulations. Work of Accident and Orthopædic Centre (Wingfield Morris Orthopædic Hospital), Oxford, includes large number of industrial injuries. Salary £819 10s. p.a., less charge for residential emoluments.

Full details and names of 3 referees to Secretary, 7, Okus-road, Swindon, Wilts, immediately.

SWINDON AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. SWINDON HOSPITALS. Applications invited for post of RESIDENT HOUSE SURGEON for General Surgical Unit of 80 Beds at Victoria Hospital. Recognised for F.R.C.S. and training under pre-registration internship regulations, and vacant on 3rd July, 1957. Married accommodation available.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon, as soon as possible.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SWINDON HOSPITALS. Applications invited for post of RESIDENT HOUSE PHYSICIAN in acute Medical Unit of 64 Beds at St. Margaret's Hospital. Recognised for training under pre-registration internship regulations and vacant on 5th July, 1957.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon, immediately.

TAUNTON (near). TONE VALE GROUP HOSPITAL MANAGEMENT COMMITTEE, NORTON FITZWARREN, near TAUNTON, SOMERSET. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER with duties mainly at Tone Vale Hospital, a modern psychiatric hospital of 1100 Beds, treating all forms of mental and nervous disorder and including a unit for psychotic children. The post provides an excellent opportunity for postgraduate training in psychiatry, including outpatient clinic work, and particularly the study of child psychiatry not only with psychotic children in the unit at the Hospital but also attendance at child guidance clinics in the county. Every facility is provided for study for the D.P.M. and facilities are also available for research and opportunities for work for the M.D. Degree. Previous holders of this post have been granted special study leave. Accommodation at a moderate charge is available for single or married officer. The appointment will, in the first instance, be limited to 3 years and will be subject to the terms and conditions of service for hospital medical staff (present salary scale £852 10s.–£1182 10s. p.a.).

Applications, giving details of age, qualifications and experience, together with the names and addresses of 2 referees, should be forwarded to the Group Secretary within 10 days of the appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (pædiatrics) based Merthyr General Hospital, Merthyr, to serve Merthyr and Aberdare Hospital Management Committee.

REGISTRAR (orthopædics), Royal Gwent Hospital, Newport. Separate Fracture and Orthopædic Unit (36 Beds). Own Outpatient, X-ray, and Rehabilitation Departments. Non-resident.

REGISTRAR (obstetrics and gynæcology), West Wales General Hospital, Carmarthen (22 obstetric, 18 gynæcology beds).

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (general surgery), Maelor General and War Memorial Hospitals, Wrexham. Resident/non-resident. Hospital recognised for F.R.C.S.

REGISTRAR (obstetrics and gynæcology), Morriston Hospital. Resident. Post recognised for M.R.C.O.G.

REGISTRAR (general surgery), Neath General Hospital. Resident/non-resident. Hospital recognised for F.R.C.S.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. SENIOR HOUSE OFFICER required for Orthopædic Surgery Department. Salary £819 10s. p.a., less £150 charge for accommodation.

Applications, giving full details and 2 names for reference, to—

W. BOWRING, Group Secretary.

Pinderfields General Hospital, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Applications invited from fully registered HOUSE OFFICERS for appointment to :—

(*a*) The Orthopædic Surgery Department.

(*b*) The Thoracic Surgery Department.

£577 10s. p.a. Residential accommodation at charge of £125 p.a.

Address written applications, giving full particulars of experience, and 2 names and addresses for reference, to—

W. BOWRING, Group Secretary.

Pinderfields General Hospital, Wakefield.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (Male or Female) (graded as Senior House Officer), vacant 1st July. The Hospital is recognised for the D.A. examination. Salary is £819 10s. p.a., less a deduction of £150 p.a. for residential emoluments.

Applications, stating qualifications and experience, should be sent to— HENRY L. BOOT, Group Secretary,

Warrington and District Hospital Management Committee.

c/o General Hospital, Warrington, Lancs.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (208 Beds.) ORTHOPÆDIC HOUSE SURGEON (with certain casualty duties) required. Post recognised for F.R.C.S.(Eng.) examination. Intermediate or Senior post depending on experience for Orthopædic Unit (30 Beds). The Orthopædic Service is in charge of a Consultant and Registrar closely associated with a Postgraduate Teaching Hospital.

Applications, with copies of 2 testimonials, to the Administrator.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (208 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital. This is a pre-registration post and is recognised for F.R.C.S. Salary according to the National Health Service scale.

Applications, with copies of recent testimonials, to the Administrator.

WATFORD, HERTFORDSHIRE. HOLYWELL HOS-PITAL. (82 Beds.) Applications are invited for the post of RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade). Care of infectious diseases 34 beds, tuberculosis 32 Beds, chest medicine 16 Beds. The duties are light, but a wide variety of clinical material is seen at the Hospital. Ample time available for reading. The Hospital is within reach of London Teaching classes.

Applications to Dr. C. W. C. KARRAN, Shrodells Hospital, Watford, Herts, as soon as possible.

WATFORD. SHRODELLS HOSPITAL. (General Hospital —320 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric Unit, a modern unit of 180 Beds. Adequate time for reading. The Hospital is within reach of London teaching classes.

Applications, together with copies of 2 testimonials, should reach the Medical Officer-in-charge as soon as possible.

WESTON-SUPER-MARE GENERAL HOSPITAL. CASUALTY OFFICER (Senior House Officer grade) required for the above Hospital. The appointment is recognised for F.R.C.S. examinations.

Applications, stating age, qualifications, and experience, together with names and addresses of 2 referees, should be addressed to Group Secretary, Weston-super-Mare Hospital Management Committee.

WEST BROMWICH AND DISTRICT GENERAL HOS-PITAL. HOUSE PHYSICIAN, vacant 1st July. Pre-registration.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WEST BROMWICH AND DISTRICT GENERAL HOS-PITAL. HOUSE SURGEON, vacant immediately. Pre-registration.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WOLVERHAMPTON. NEW CROSS HOSPITAL. Senior HOUSE OFFICER required as sole resident for 45 obstetric beds. Post recognised for D.Obst.R.C.O.G. Married quarters available.

Applications to Secretary.

WOLVERHAMPTON AND MIDLAND COUNTIES EYE INFIRMARY. SENIOR HOUSE OFFICER required. 100 Beds and busy Outpatient Department. Recognised for F.R.C.S. and D.O. examinations.

Applications to Secretary as soon as possible.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICERS. Vacancies in Medicine occur on 17th and 21st July, 1957.

Please apply, with copies of 2 testimonials, to Hospital Secretary.

WOLVERHAMPTON GROUP. The Royal Hospital. JUNIOR PATHOLOGIST required. Salary in Junior Hospital Medical Officer grade. Comprehensive service offering wide experience and training. Experience in specialty not essential. Post vacant shortly. Candidates may visit Pathologist.

Applications to Group Secretary, The Royal Hospital, Wolverhampton, by 28th June, 1957.

WORKINGTON INFIRMARY, Cumberland. (155 Beds. Pre-registration post. Recognised F.R.C.S. (Ed.).) HOUSE SURGEON (first, second, or Senior House Officer post), vacant end of July.

Detailed applications, with dates and names of 2 referees, to Secretary.

WEST MALLING, KENT. LEYBOURNE GRANGE COLONY FOR MENTAL DEFECTIVES. (1521 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required. Salary scale £852 10s.–£55–£1182 10s. a year. Appointment is subject to the terms and conditions of service for hospital medical and dental staffs and is for a period of 3 years in the first instance. Furnished or unfurnished accommodation available for married officer. Ample facilities for study.

Applications, with full details as to age, nationality, qualifications, present post, and previous experience, together with names and addresses of 2 referees, to the Group Secretary as soon as possible.

WINDSOR. KING EDWARD VII HOSPITAL. Casualty OFFICER required, Senior House Officer grade. Department forms part of Accident Service of Windsor Group. Duties include House Surgeon to E.N.T. and Eye Departments. Previous experience in treatment of acute injuries desirable.

Applications, stating age, qualifications with dates, nationality, with copies of recent testimonials, to Secretary.

WREXHAM. MAELOR GENERAL HOSPITAL. (591 Beds.) Applications are invited for the post of HOUSE PHYSICIAN at the above Hospital to commence duties on 1st August, 1957. The post is recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

WREXHAM. MAELOR GENERAL HOSPITAL. (591 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence duties on 1st August, 1957. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is a pre-registration post.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

WREXHAM. WAR MEMORIAL HOSPITAL. (230 Beds.) Applications are invited for the post of HOUSE PHYSICIAN at the above Hospital to commence duties on 1st August, 1957. The post is recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

WREXHAM. WAR MEMORIAL HOSPITAL. (230 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence duties on 1st August, 1957. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is a pre-registration post.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

WREXHAM (near). TREVALYN MANOR MATERNITY HOSPITAL, ROSSETT, near WREXHAM. (47 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence duties on 1st August, 1957. The Hospital is recognised by the Central Midwives Board as a Part II Midwifery Training School and deals with normal and abnormal midwifery.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

YORK. NABURN AND BOOTHAM PARK HOSPITAL. YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE. There will shortly be a vacancy for a JUNIOR HOSPITAL MEDICAL OFFICER in Psychiatry at this Hospital of 630 Beds including Health Service, Amenity and Private categories. The annual admission-rate is over 550 and the inpatient and outpatient work offers experience in all branches of psychiatry. Emphasis is laid upon the social factors in psychiatric illness; the Hospital is an integral part of the York Comprehensive Mental Health Service. Preference will be given to candidates who wish to avail themselves of the facilities offered to attend the D.P.M. Course at Leeds University.

Applications, giving details of career with the names of 3 referees, should be sent to the Physician-Superintendent, Bootham Park, York, not later than 12th July.

DUBLIN. ROYAL VICTORIA EYE AND EAR HOSPITAL. Applications are invited for the post of CLINICAL ASSISTANT in the Eye Department of above Hospital.

Applications, stating age, qualifications, and experience, to be addressed to the Hospital Secretary before 30th June, 1957.

CHANNEL ISLANDS. JERSEY GENERAL HOSPITAL. Applications are invited for the post of MEDICAL OFFICER which will be vacant on 10th July, 1957, in the above Hospital. The appointment is for 6 months but is renewable for a further 6 months. Salary scale from £650 to £850 p.a., less £125 p.a. residential emoluments according to experience.

Early applications to be submitted to the President, Public Health Committee, General Hospital, Jersey, C.I.

CHANNEL ISLANDS. JERSEY GENERAL HOSPITAL. Applications are invited for the post of CASUALTY OFFICER which will be vacant on 1st September, 1957. The appointment is for 12 months, but is renewable for a further 12 months. Salary £850 p.a., less £125 p.a. for residential emoluments.

Applications to be submitted not later than 13th July, 1957, to the President, Public Health Committee, General Hospital, Jersey, C.I.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as TUTOR/REGISTRAR in Therapeutics and Pharmacology at hospitals managed by the Belfast Hospital Management Committee. The appointment will be made jointly by the Authority and the Queen's University, Belfast, and will involve teaching and other University duties as Tutor in the Department of Therapeutics and Pharmacology. The department has charge of beds at the above hospitals.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and which must be returned so as to be received not later than 6th July, 1957.

CANADA. ROYAL JUBILEE HOSPITAL, Victoria, BRITISH COLUMBIA. 1-year approved ROTATING INTERNESHIP in the above Hospital. Organised training programme. Stipend $175 per month, plus accommodation. Married internes may live out of the Hospital. 2 weeks vacation. British and American graduates only.

Applications or requests for further information to Medical Administrator, Royal Jubilee Hospital, Victoria, B.C., Canada.

ST. JOHN'S, NEWFOUNDLAND, CANADA. GENERAL HOSPITAL. DEPARTMENT OF PATHOLOGY. Applications are invited for the following posts:—

JUNIOR ASSISTANT PATHOLOGIST. Salary $4500 p.a. At least 2 years postgraduate training in surgical and autopsy pathology desirable.

INTERNE (pathology). Salary $2500 p.a. Previous experience in pathology is not required. The Pathology Department is approved by the Royal College of Physicians and Surgeons of Canada for postgraduate training.

Transportation to St. John's will be paid by the Hospital.

Applications in writing, with copies of 3 recent testimonials, should be forwarded as soon as possible to—

Dr. E. WILSON, Superintendent.
General Hospital, St. John's, Newfoundland, Canada.

U.S.A. CAMBRIDGE, MASSACHUSETTS. Applications are invited for the positions of RESIDENCIES in Anesthesia for a 2-year period beginning 1st July and 1st September, 1957. Salary $1800 first year and $3600 second year and full maintenance. Training in all branches of anesthesia. Affiliation with other hospitals.

Applications, stating age, nationality, qualifications, and experience, together with the names of their referees, should be forwarded to the Director of Anesthesiology, P.O. Box 89, Cambridge, Massachusetts. Travelling expenses to and from the U.S.A. will be paid. Particulars will be sent as soon as application is received. Please enclose recent photograph with application.

Public Appointments

BOROUGH OF ST. MARYLEBONE. Applications are invited from duly registered medical practitioners for the appointment of MEDICAL OFFICER OF HEALTH of the Metropolitan Borough of St. Marylebone and MEDICAL REFEREE of the St. Marylebone Crematorium, at an inclusive salary of £2445 p.a., rising by annual increments of £105 to £2865 p.a., plus car allowance of £100 p.a.

The official form of application and conditions of appointment may be obtained from the Town Clerk, Town Hall, St. Marylebone, W.1, to whom applications must be sent to arrive not later than Monday, 15th July, 1957. Canvassing will disqualify.

BASUTOLAND AND SWAZILAND PROTECTORATES. MEDICAL OFFICERS with qualifications registrable in United Kingdom required for general duties. Appointment on 2 years probation to the pensionable establishment. Salary £940–£1515 a year, starting point determined by age and experience. Following also payable:—

(a) Cost-of-living allowance of 12% of salary up to maximum of £132 a year for married officers and half this rate for single officers.

(b) Education allowance of £50 for each child (up to 3 under the age of 18) for education outside territory.

Free passages for Officer, wife, and up to 3 children. Local leave permitted and generous home leave granted after each tour of 24–30 months. Income-tax at low local rates.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/76/01).

HER MAJESTY'S OVERSEAS CIVIL SERVICE. Medical OFFICERS required in North Borneo for general clinical work in tropical and other diseases, maternity and child welfare, promotion of public and rural health and sanitation, with limited administrative duties. Must be prepared to perform emergency surgery, attend midwifery cases, and travel to outlying places. Candidates should possess qualifications registrable in United Kingdom and have had at least 1 years postgraduate hospital experience; D.T.M. and H. desirable but not essential. Appointment on permanent basis with pension (non-contributory) 1/600th of final pensionable emoluments for each completed month of pensionable service. Salary scale, including inducement pay, £1470–£2324. In addition, married officers with 1 or more dependent children under 18 receive allowance of 7½% of salary (maximum £140 a year), and an education allowance of £140 a year each up to 2 children between 5 and 18 years educated outside North Borneo. Quarters provided at low rental. Free passages for Officer, wife and up to 3 children under 18 years of age. Generous leave. Income-tax at local rates.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/21/04).

HER MAJESTY'S OVERSEAS CIVIL SERVICE. Applications invited from Doctors with qualifications registrable in United Kingdom for following posts in British Guiana. Diploma in Pathology or Bacteriology required for (*a*) and D.O.M.S. or F.R.C.S. (Eye) plus active engagements during past 3 years for (*b*).

(*a*) PATHOLOGIST for New Amsterdam and Mental Hospitals, to have charge of Laboratory staff, buildings and equipment, to supervise laboratories of Government Hospitals and be responsible for training of laboratory technicians.

(*b*) JUNIOR OPHTHALMOLOGIST to assist in treatment of eye diseases at Public Hospital, Georgetown, and other hospitals as required, to be responsible for indoor and outdoor patients including special inspections of school children and clinic sessions at District Hospitals.

Salary for (*a*) and (*b*) £1600 a year plus £250 a year (non-pensionable) in lieu of consultation fees.

(*c*) MEDICAL OFFICERS for usual duties of Government Medical Officer in any part of Colony. May first be under supervision of experienced Medical Officer in a Public Hospital. Salary scale £950–£1450 a year.

Appointments on permanent basis with pension (non-contributory) 1/600th of final pensionable emoluments for each completed month of service; or on contract for 3 years resident service with gratuity (taxable) of 22½% of salary for each 3 months service. Candidates from National Health Service may retain superannuation rights (up to 6 years) and receive gratuity of 20% of salary on leaving overseas employment. (Only permanent officers are members of Her Majesty's Overseas Civil Service.) Free unfurnished quarters or allowance of £100 a year in lieu when attached to an Institution. In districts where quarters available rent payable at 10% of salary. Free passages for Officer, wife, and children under 18 years up to 5 persons in all. Assisted passages for Officer and wife on leave.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/30/019).

DERBY. COUNTY BOROUGH OF DERBY. Education COMMITTEE. Applications are invited for the post of SCHOOL MEDICAL OFFICER AND ASSISTANT MEDICAL OFFICER OF HEALTH in the Public Health Department and School Health Service. Salary £1050–£1475. Car allowance. Applicants must be duly registered medical practitioners and the possession of the D.P.H. or D.C.H. is desirable, though not essential. Duties will include work in connection with School Health and Child Welfare Services, and such other duties as may be required by the Council. The officer appointed will be required to devote his/her whole-time to the duties of the post, and to act under the instructions of the Medical Officer of Health. The post is superannuable, and the selected candidate will be required to pass a medical examination. The appointment will be held during the pleasure of the Council and is terminable by 2 months' notice on either side.

Application forms may be obtained from the Director of Education, Education Office, Becket-street, Derby, to whom they should be returned as soon as possible.

DOVER. BOROUGH AND PORT OF DOVER. Applications are invited for the whole-time appointment of DEPUTY MEDICAL OFFICER OF HEALTH. Candidates must be registered medical practitioners, preferably possessing a Diploma in Public Health. The duties of the appointment include Port Health and the Medical Inspection of Aliens at the Port of Dover, and the person appointed will be required immediately to accept office as Deputy Medical Officer of Health of the Rural Districts of Dover and Elham, with the possible addition later of the areas of other local authorities. He will also be required to assist the Medical Officer of Health as Medical Officer of the Dover Isolation Hospital. Salary and increments will be in accordance with Whitley Council Committee C Scale for Deputies, viz.: £1226 13s. 4d.–£55–£1446 13s. 4d. maximum, plus travelling allowance, which salary is subject to possible increase in the event of the addition of a further area or areas as mentioned above. The appointment will be subject to a medical examination for superannuation purposes, and the person appointed will be required to reside in the Borough of Dover.

Further particulars and form of application, may be obtained from the undersigned, to whom applications must be delivered not later than 8th July, 1957.

JAMES A. JOHNSON, Town Clerk.

New Bridge House, Dover, 11th June, 1957.

GOVERNMENT OF THE FEDERATION OF NIGERIA. ANÆSTHETIST required to administer anæsthetics in Government Hospitals in Lagos, instruct Junior Medical Officers, and perform such other duties as may be assigned to him. Candidates must possess medical qualifications registrable in the United Kingdom, the Diploma in Anæsthetics (if obtained prior to November, 1953), or Fellowship of the Faculty of Anæsthetists. Appointment either as Special Grade Medical Officer or as Specialist.

Appointment may be:—

(*a*) On short-term contract for 1 tour of 18–24 months with salary of £2664 a year, or on scale from £1536 to £2286 for Special Grade Medical Officer. On completion of contract a gratuity (taxable) is paid at rate of £37 10s. for each completed period of 3 months service including leave.

(*b*) From National Health Service, candidate retaining superannuation rights and receiving gratuity (taxable) of 20% of aggregate of salary. Salary £2220 a year, or from £1326 to £1950 for Special Grade Medical Officer.

Quarters at low rental. Free return passages for Officer and wife. Return passages for children, to age 18, provided this does not exceed cost of 2 adult return passages in any 1 tour of service. Children's (Separate Domicile) allowance of £75 a year for each child under 18, ceasing if children join parents in Nigeria. Income-tax at low local rates. Local leave permissible and generous home leave after each tour.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/14/045).

GOVERNMENT OF THE FEDERATION OF NIGERIA. MEDICAL OFFICER (Special grade) (Mental Health) required to undertake investigations on mental illness, to examine and treat institutionally or otherwise, persons suffering from mental illness, and to advise Government on Mental Health with particular reference to organisation and expansion of Mental Health Services, training of staff and legislation. Candidates must possess medical qualifications registrable in United Kingdom and D.P.M. or equivalent.

Appointment:—

(*a*) On short-term contract with inclusive salary from £1536 to £2286 p.a. On completion of contract gratuity (taxable) is paid of £37 10s. for each completed period of 3 months service (including leave).

(*b*) From National Health Service with inclusive salary from £1326 to £1950 p.a., candidate retaining superannuation rights and receiving gratuity (taxable) of 20% of aggregate of salary.

Quarters at low rental. Free return passages for Officer and wife. Return passages for children, to age 18, provided cost does not exceed that of 2 adult return passages in any 1 tour of service. Children's (Separate Domicile) allowance of £75 a year for each child under 18, ceasing if children join parents in Nigeria. Income-tax at local rates. Local leave permissible and generous home leave after each tour.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/14/050).

GOVERNMENT OF NORTHERN RHODESIA. Medical OFFICER required for Silicosis Medical Bureau. Duties include clinical and radiological examination of miners (European and African). Officer will be stationed at Kitwe and will work under supervision of Chairman (a Medical Specialist) of the Silicosis Medical Bureau. Kitwe is a town of considerable size with agreeable climate and many social amenities. Post offers excellent opportunity for experience in diseases of chest and research in pneumoconiosis. Appointment on permanent basis with pension, or short-term contract with gratuity (taxable). Candidates from National Health Service may retain superannuation rights (up to 6 years) and receive gratuity (taxable) of 20% of aggregate of salary at end of engagement. Salary scale £1245–£2030 a year, starting salary depending upon age and experience. Pension for permanent appointment at rate of 1/600th of final pensionable emoluments for each completed month of service. Gratuity for contract appointment £37 10s. for each completed 3 months of service. Free passages provided in both directions for Officer and wife, and assisted passages for children. Housing available and married candidates may take family. Candidates (male only) should be aged 25–35, possess medical qualifications registrable in United Kingdom, and have had at least 12 months postgraduate experience.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/3/02).

GOVERNMENT OF BERMUDA. Government Psychia-TRIST (part-time) required to supervise mental treatment of patients at the Mental Hospital, advise on admissions and discharges, and on mental health programmes and undertake other duties as required within his specialty. Candidates must possess medical qualifications registrable in the United Kingdom, D.P.M. or equivalent, and experience. Appointment on agreement for 3 years. Salary £2000 p.a. Cost-of-living allowance £150 p.a. No direct taxation. Government quarters not provided. Rent for furnished accommodation £35–£40 per month. Private practice in consultant capacity may be permitted. Free passages for Officer, wife, and children, not exceeding 5 persons in all.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/29/02).

EXETER. CITY AND COUNTY OF THE CITY OF EXETER. SCHOOL MEDICAL OFFICER AND ASSISTANT MEDICAL OFFICER OF HEALTH. The duties will be mainly in connection with the School Health and Child Welfare Services but the appointed candidate will assist in other sections of the Department. The successful candidate will gain administrative experience in school health work. The possession of a D.P.H. or D.C.H. would be an advantage. Whitley scales and conditions. Salary £1050–£50–£1200–£55–£1475. Commencing salary according to experience. Casual car user allowance.

Application forms from Dr. E. D. Irvine, Medical Officer of Health, and Principal School Medical Officer, 5, Southernhay-west, Exeter, to whom they should be returned not later than 8th July, 1957.

14th June, 1957. C. J. NEWMAN, Town Clerk.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
LINCOLN ..	LINCOLN ..	..6TH JULY, 1957

GREENOCK. CORPORATION OF GREENOCK. Applications are invited from registered medical practitioners for the post of ASSISTANT MEDICAL OFFICER OF HEALTH (Male). Salary £1050 rising to £1475 p.a. with placing according to previous experience. The post is superannuable. Possession of a Diploma in Public Health would be an advantage. The duties, which will be mainly in connection with the Maternity and Child Welfare and School Health Services, will also include port health, infectious diseases, immunisation and vaccination, including B.C.G., and such other duties as the Medical Officer of Health may direct from time to time. A car allowance is payable in accordance with the scheme operated by the Corporation. Housing accommodation, if required, is available for the successful applicant.

Applications, stating age, experience and qualifications and accompanied by copies of 3 recent testimonials, should be lodged with the undersigned not later than Friday, 5th July, 1957.

JOHN LIDDELL, Town Clerk.

Municipal Buildings, Greenock, 12th June, 1957.

RADIOTHERAPIST
required by
SASKATCHEWAN DEPARTMENT OF PUBLIC HEALTH
for
ALLAN BLAIR MEMORIAL CLINIC, REGINA

Salary range : $11,000–$13,500 per year (Exchange—£1 = $2.70 approximately).

Requirements.—Radiotherapist with D.M.R. (T.). A full range of therapeutic equipment is in use. A rotating cobalt unit will be installed in the near future. There is an active isotope laboratory. Beds are under the direct control of the Radiotherapist. There are approximately 850 new cancer cases seen annually.

How to apply.—For further information write Dr. T. A. WATSON, Director of Cancer Services for Saskatchewan, Cancer Clinic, University Hospital, Saskatoon, Canada. Applicants should refer to c/c4640.

LONDON COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as Whole-time MEDICAL OFFICER in the Public Health Department. Inclusive salary scale £1050–£1475. Commencing salary dependent on local government service. No emoluments. Duties are primarily connected with child health. It will be an advantage if the candidate is experienced in maternity and child welfare work and the School Health Service and has the Diploma in Public Health.

Application forms from the Medical Officer of Health (PH/D.1/1145), The County Hall, Westminster Bridge, S.E.1, returnable by 15th July.

SOUTHPORT. COUNTY BOROUGH OF SOUTHPORT. Applications are invited from registered Male or Female medical practitioners for the appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY SCHOOL MEDICAL OFFICER. Applicants should possess a Diploma in Sanitary Science, Public Health or State Medicine and should have had experience in a health department. Salary scale £1269–£55 (4)–£50 (1)–£1539, plus travelling allowance on a mileage basis.

Application forms and conditions of appointment may be obtained from the Medical Officer of Health, 2, Church-street, Southport, to whom applications should be sent to arrive not later than 1st July, 1957, with envelopes endorsed "Deputy Medical Officer of Health" in the top left-hand corner.

R. EDGAR PERRINS, Town Clerk.

THE REPUBLIC OF THE SUDAN. The Ministry of Health requires the services of 2 CLINICAL PATHOLOGISTS for work at the Stack Medical Research Laboratories, Khartoum. Candidates must have the Diploma, Clinical Pathology. Appointment will be on a short-term contract for a period up to 5 years in salary range of £S.1750–£S.2330. Starting pay will be determined according to age, qualifications and experience. A cost-of-living allowance is payable and an outfit allowance of £S.50 on appointment. Annual leave accrued at the rate of 7 days per month is granted. Free air passage on appointment. No income-tax is payable in the Sudan.

For further information and application forms write to, Dr. E. P. PRATT, 137, Harley-street, London, W.1. Quoting reference "Clinical Pathologists, 4/1218." Closing date 15th July.

General Practice

For an ***Executive Council post*** *(England and Wales) apply on form* E.C.16A *obtainable from the council. Mark envelope "Vacancy."*

BRISTOL EXECUTIVE COUNCIL. Applications invited to fill a General Medical Practice VACANCY which will arise on 30th September, 1957, urban. List at present approximately 4560. 1 or more applicants, separately or in partnership may be considered. Residence and surgery available for purchase. Apply before 5th July, 1957, on Form E.C.16A obtainable on application to the Clerk, Bristol Executive Council, 5, Alexandra-road, Bristol, 8. Please mark envelope "C."

STOCKWOOD ESTATE (BRISTOL). Applications are invited for a General Medical Practice VACANCY in the Sturminster-road area of the Stockwood Housing Estate which will arise on 1st October, 1957. There is no list but the successful applicant will be granted the Initial Practice Allowance, if eligible. The housing authority has contracted for the erection of 526 dwellings due to be completed by October, 1958, and it is anticipated that a total number of 900 new dwellings will ultimately be erected. Temporary residential and surgery accommodation will be available to the successful applicant and later permanent accommodation, if required. Apply before 6th July, 1957, on Form E.C.16A, obtainable from the Clerk, Bristol Executive Council, 5, Alexandra-road, Bristol, 8.

Hospital Services : Non-Medical Appointment

GROUP LABORATORY, MILE END HOSPITAL, Bancroft-road, London, E.1. BIOCHEMIST required. Medical qualification not essential ; experience in hospital biochemistry desirable. Research work encouraged. Whitley Council salary scale and conditions of service.

Applications, stating age, qualifications, experience and the names of 2 referees, to the Secretary, Stepney Group Hospital Management Committee, Raine-street, London, E.1, by 28th June, 1957.

Miscellaneous

Thriving Nursing-home of 18 Beds in popular West Country resort. Lift. H. and C. all Bedrooms. Audited accounts show excellent results. For sale as a going concern.—Apply, Address, No. 303, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

The Trade Marks set out below were assigned on 8th March, 1957, by Ethicon Limited (formerly Ethicon Suture Laboratories Limited) of Bankhead-avenue, Sighthill, Edinburgh, to Ethicon Inc., of New Brunswick, New Jersey, U.S.A., WITHOUT THE GOODWILL OF THE BUSINESS IN WHICH THEY WERE THEN IN USE and in so far only as concerns the rights to the use of the marks on goods for export to and sale in Greece.

No.	*Mark*	*Goods*
540864 ..	ETHICON ..	All goods included in Class 11 (Schedule III).
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Pharmaceutical Industry. Bayer Products Limited require a Doctor with a good scientific background (organic chemistry, pharmacology, bacteriology or pharmacy) or other suitably qualified person for research liaison work. As the position will involve considerable Continental travel, a knowledge of a European language is essential. The successful applicant will also be concerned with the evaluation of new drugs in Britain. The work is interesting, adequately remunerative and has good prospects in a rapidly expanding organisation. —Applications in confidence to the Managing Director, BAYER PRODUCTS LIMITED, Neville House, Eden-street Kingston-on-Thames, Surrey.

Medical Officer required August/September by Mining Company in Sierra Leone. Interesting and constructive field work. Applicants should have wide general medical experience and ability to do emergency surgery. D.T.M. & H. an advantage. Commencing salary according to age and experience but not less than £2000 p.a. plus 5% bonus plus for married man, £10 per month marriage allowance and £5 per month for each child under 18. Salary reviewed annually. Retirement under contributory pension scheme at age 55. Tours of duty approximately 15 months followed by liberal leave on full salary in U.K. Return passage paid, free furnished quarters. Life Assurance and Dependants Income Schemes.—Write, giving full particulars, stating age, married or single to SIERRA LEONE DEVELOPMENT CO. LTD., Dept. MO. 2, City-Gate House, Finsbury-square, E.C.2.

Rhokana Corporation Limited. A Medical Officer is required for Rhokana Corporation Mine Medical Service at Kitwe, Northern Rhodesia. There is a vacancy for a Medical Officer with an advanced qualification in medicine, preferably one who has had experience as Registrar. He will work under the Chief Medical Officer in association with the Physician already employed by the Corporation. His duties will include the care of patients in the Corporation's hospitals (European and African) under the direction of the Specialist Physician, the holding of clinics and some general practice. The Corporation employs 10 medical practitioners inclusive of the above-mentioned. Salary is at the rate of £1700 p.a., part of which is deemed to be in lieu of private practice. A modern house of bungalow type will be available immediately at a nominal rental. Water is free and the charges for light are low. A motor-car is provided free for use within the Corporation's area. There is a contributory pension scheme and a bonus is payable which varies with the profits made and is at present in the vicinity of 45% of salary ; it is paid in part at Christmas, on going on leave and in cash and a portion is deposited as compulsory savings withdrawable only on termination of service. Holiday leave is at the rate of 51 days p.a. accumulative up to a maximum of 153 days. The Corporation pays the cost of the outward passage of the successful applicant and wife and family.

Application forms can be obtained from RHOKANA CORPORATION LIMITED, 40, Holborn-viaduct, London, E.C.1.

Locum wanted for Medical Superintendent, St. Lucy's Hospital, St. Cuthbert's Mission, Tsolo, Cape Province, from 1st March to 1st October, 1958. Duties comprise average 150 inpatients, daily outpatient service of approximately 30 patients. Applicant must have had 4 years experience, have a knowledge of obstetrics, anæsthetics, X-ray interpretation and emergency surgery. Salary (including cost-of-living allowance) £1200, plus £100 for each child. Rent-free house available. Nearest junior school 8 miles, senior school 40 miles. If applicant suitable and wishes, permanent post on staff might be considered.—Replies to DR. VAN DER WALT. St. Lucy's Hospital.

Tanganyika. Medical Officer urgently required for Catholic Mission hospital. D.T.M. not essential.—Particulars from Dr. L. D. STIRLING, 17, Kensington-court, London, W.8.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimens of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

Doctor's 4-Berth Caravan to let July, August, and September. Private site close sea, riding, sailing. West Wittering. 10 guineas weekly.—Richmond 2660.

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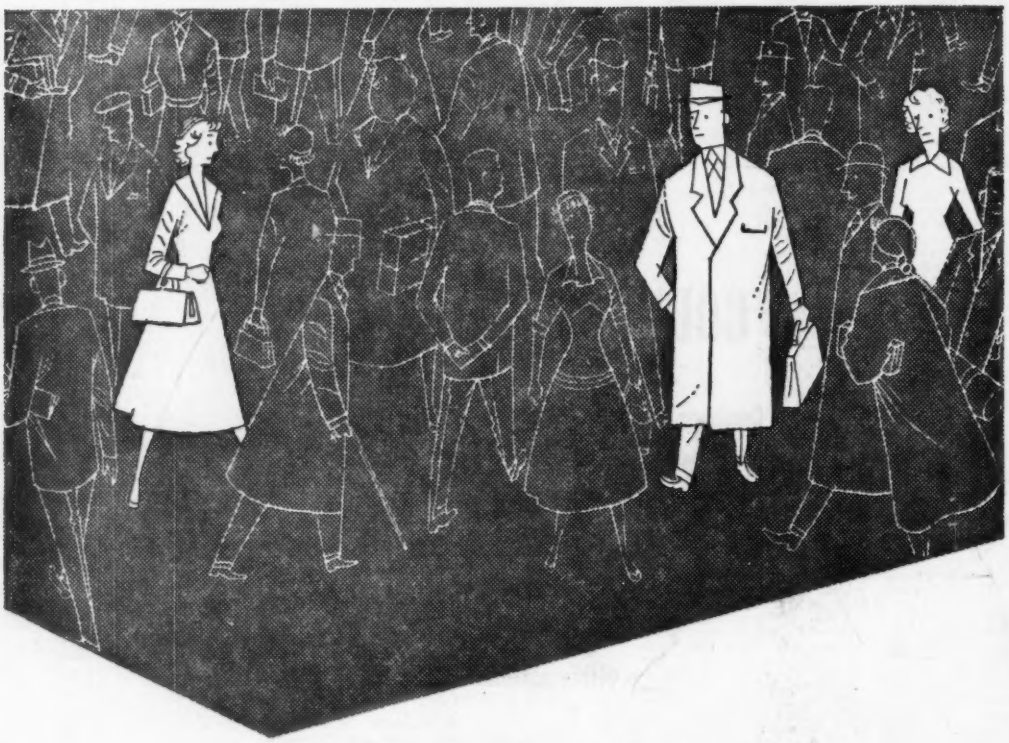

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